

GARDEN GROVE SANITARY DISTRICT SEWER SYSTEM MANAGEMENT PLAN APRIL 2020



GARDEN GROVE SANITARY DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

Prepared by:

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April 2020

**GARDEN GROVE SANITARY DISTRICT
SEWER SYSTEM MANAGEMENT PLAN**

Certification

I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

William E. Murray Jr., PE
Public Work Director
Garden Grove Sanitary District

Date

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SECTION 1 INTRODUCTION

1-1 WASTE DISCHARGE REQUIREMENTS ORDER NO. 2006-003

Provision 11 of State Water Resources Control Board (SWRCB) Order No. 2006-0003 (Order), Statewide General Waste Discharge Requirements for Sanitary Sewer Systems sets the requirement for the preparation of a Sewer System Management Plan:

11. *The enrollee (Garden Grove Sanitary District) shall develop and implement a written Sewer System Management Plan (SSMP) and make it available to the State and/or Regional Water Board upon request. A copy of this document must be publicly available at the District's office and/or available on the internet. This SSMP must be approved by the Garden Grove Sanitary District Board of Directors at a public meeting.*

The essential elements of the SSMP are detailed in Provision 13 of the Order No. 2006-0003, which is included in Appendix A-1 of this report.

The Garden Grove Sanitary District (District) addresses each element listed in Provision 13 of the Order, throughout this SSMP document. The following sections list each essential element of the SSMP, and describe how the District is in compliance with each.

1-2 MONITORING AND REPORTING PROGRAM ORDER NO. WQ 2013-0058-EXEC

The District shall comply with the SWRCB Monitoring and Reporting Program Order WQ 2013-0058-EXEC, which is included in Appendix A-2 of this report. Order WQ2013-0058-EXEC is an amendment to Order 2006-0003. The District shall stay educated and in compliance with all future revisions thereto, as specified by the Executive Director.

1-3 DOCUMENT AVAILABILITY

As required by the SWRCB, copies of this SSMP are maintained at the following locations:

1. Municipal Service Center: 13802 Newhope St, Garden Grove, CA 92843
2. City Clerk's Office: 11222 Acacia Parkway, Garden Grove, CA 92840

These copies are available to sanitary sewer system operating and maintenance personnel at all times.

1-4 ABOUT THIS DOCUMENT

The District has prepared this SSMP document to comply with Order 2006-0003 and Order WQ 2013-0058-EXEC. Some elements of this document have been summarized from comprehensive stand-alone reports to minimize the physical size of the SSMP document. These reports often include large maps, detailed tables, and more details to address the requirements of the SSMP.

SECTION 2 GOALS

Order 2006-0003-DWQ states that:

The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.

The purpose of Order 2006-2003 is to prevent sanitary sewer overflows (SSOs). The Garden Grove Sanitary District (District) has prepared its SSMP to comply with this order.

The SSMP document will ensure that the District properly fund, manage, operate and maintain, with adequately trained staff and/or contractors possessing adequate knowledge skills and abilities as demonstrated through validated program at all times, all parts of the sanitary sewer system owned and/or operated by the District.

2-1 COMPLIANCE

The goals of the SSMP are to:

- Prevent or reduce Sanitary Sewer Overflow (SSOs)
- Provide a plan and schedule for measures to continue implementing measures to prevent or reduce SSOs
- Provide adequate sewer capacity
- Reduce the discharge of Fats, Oils, and Grease (FOG) into its sewer system
- Provide adequate sewer cleaning and maintenance
- CCTV inspect the condition of the sewer system on a regular basis
- Maintain adequate legal authority to implement all elements of the SSMP
- Implement sewer improvement projects as indicated in the District's Capital Improvement Program
- Maintain adequate funding for the operation, maintenance, and repair of its system
- Provide detailed plan to address SSOs. This shall include the procedures to respond to the SSO, notify the appropriate individuals/parties, contain the SSO, clean up the affected areas, and properly report the SSO. The time to respond to the spill shall not exceed one hour.
- Provide routine training for safety, updated equipment and technology, spill response, and all other relevant operation and maintenance topics

SECTION 3 ORGANIZATION

Order 2006-0003-DWQ requires that the SSMP identify:

- (a) *The name of the responsible or authorized representative as described in Section J of this Order,*
- (b) *The names and telephone numbers of management, administrative and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and*
- (c) *The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board, and other agencies as applicable (such as County Health Officer, County Environmental Health Agency, and/or State Office of Emergency Services (OES)).*

3-1 COMPLIANCE

A. LEGALLY RESPONSIBLE OFFICIAL

Order 2006-0003-DWQ requires that the SSMP identify, *“The name of the responsible or authorized representative as described in Section J of this Order.”*

The District identifies Bill Murray, the Public Works Director, as the responsible representative, who shall sign and certify all reports required by Order 2006-0003-DWQ.

B. ORGANIZATION CHART

Order 2006-0003-DWQ requires that the SSMP identify, *“The names and telephone numbers of management, administrative and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation.”*

Figure 3-1 and Figure 3-2 illustrate the line of authority for the District officials and staff responsible for implementing the SSMP measures. The current contact information for the responsible officials and staff are included.

Specific Responsibilities for officials and staff are described for each position is summarized in Table 3-1.

Roles and responsibilities for District personnel are described in further detail in Appendix B-1 of this document.

C. CHAIN OF COMMUNICATION FOR SSOS

Order 2006-0003-DWQ requires that the SSMP identify, *“The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Board, and other agencies as applicable (such as County Health Officer, County Environmental Health Agency, and/or State Office of Emergency Services (OES).”*

The District has prepared a stand-alone document for the Sanitary Sewer Overflow Emergency Response Plan (SSOERP) element of the SSMP requirements. It includes a list of individuals and agencies that need to be contacted in the event of a sanitary sewer overflow (SSO). Figure 3-3 details the procedures to respond to SSOs. The Sanitation Supervisor will be the responsible staff to report the SSO to the State Water Board and other appropriate agencies.

A summary of SSO notification and reporting procedures are included in Appendix B-2 of this report.

**Figure 3-1
GGSD Organization Chart**

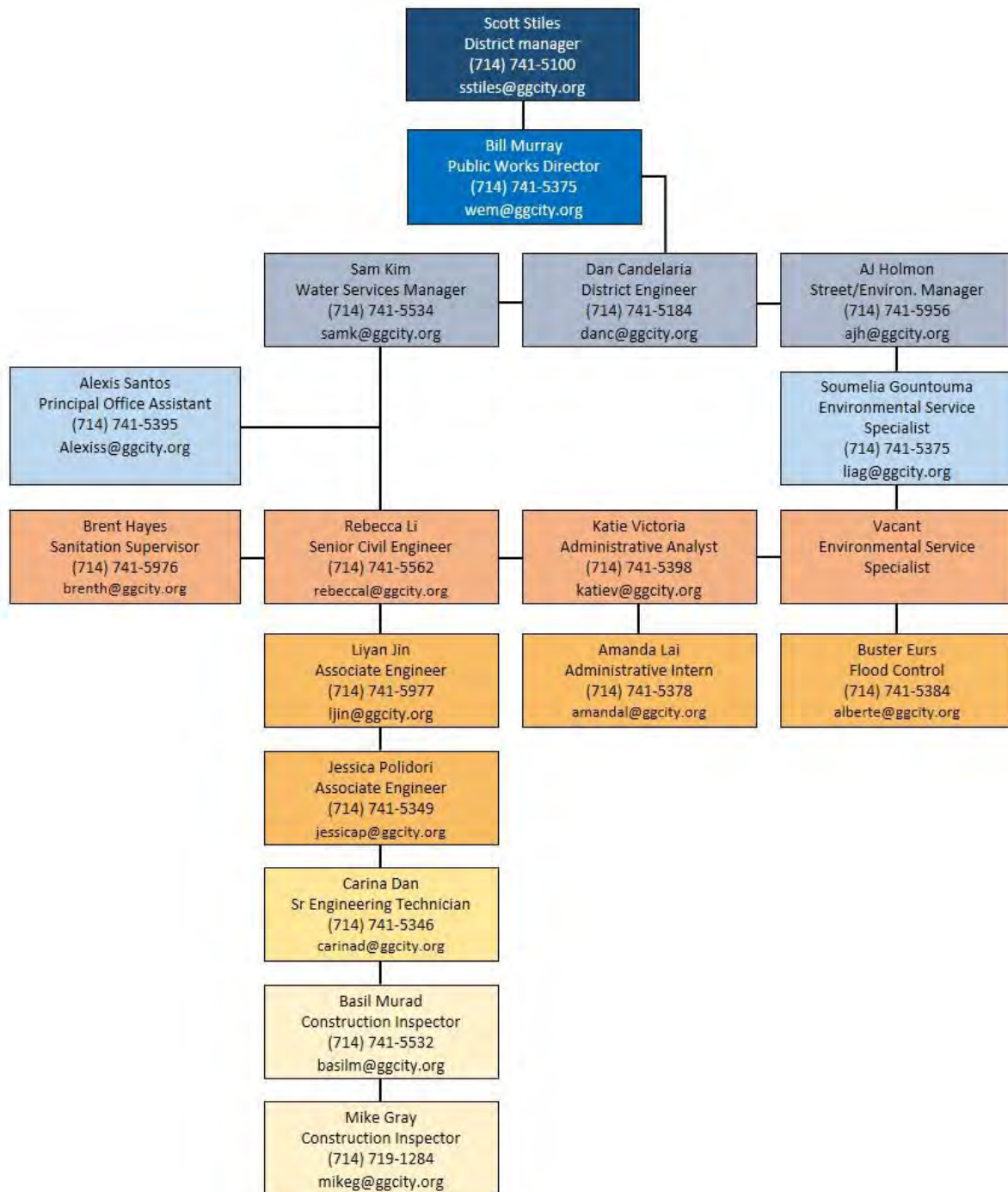
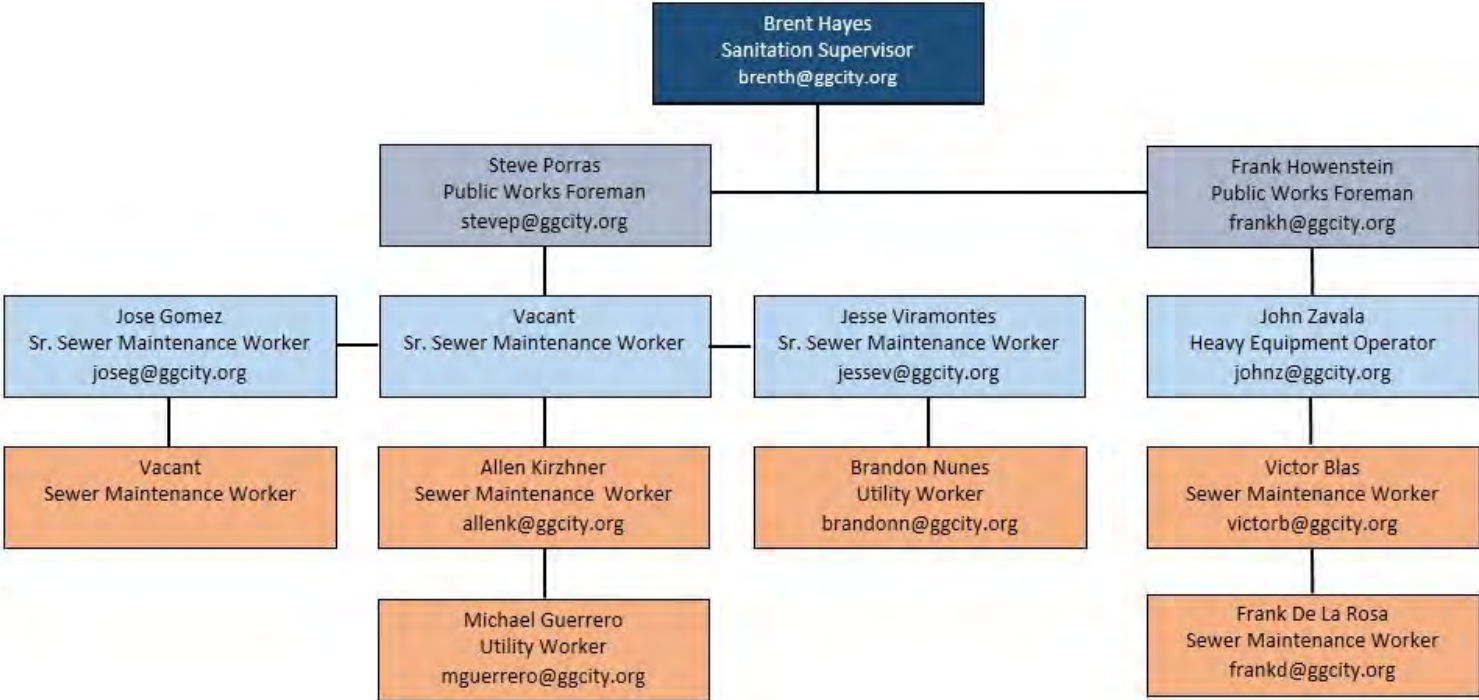


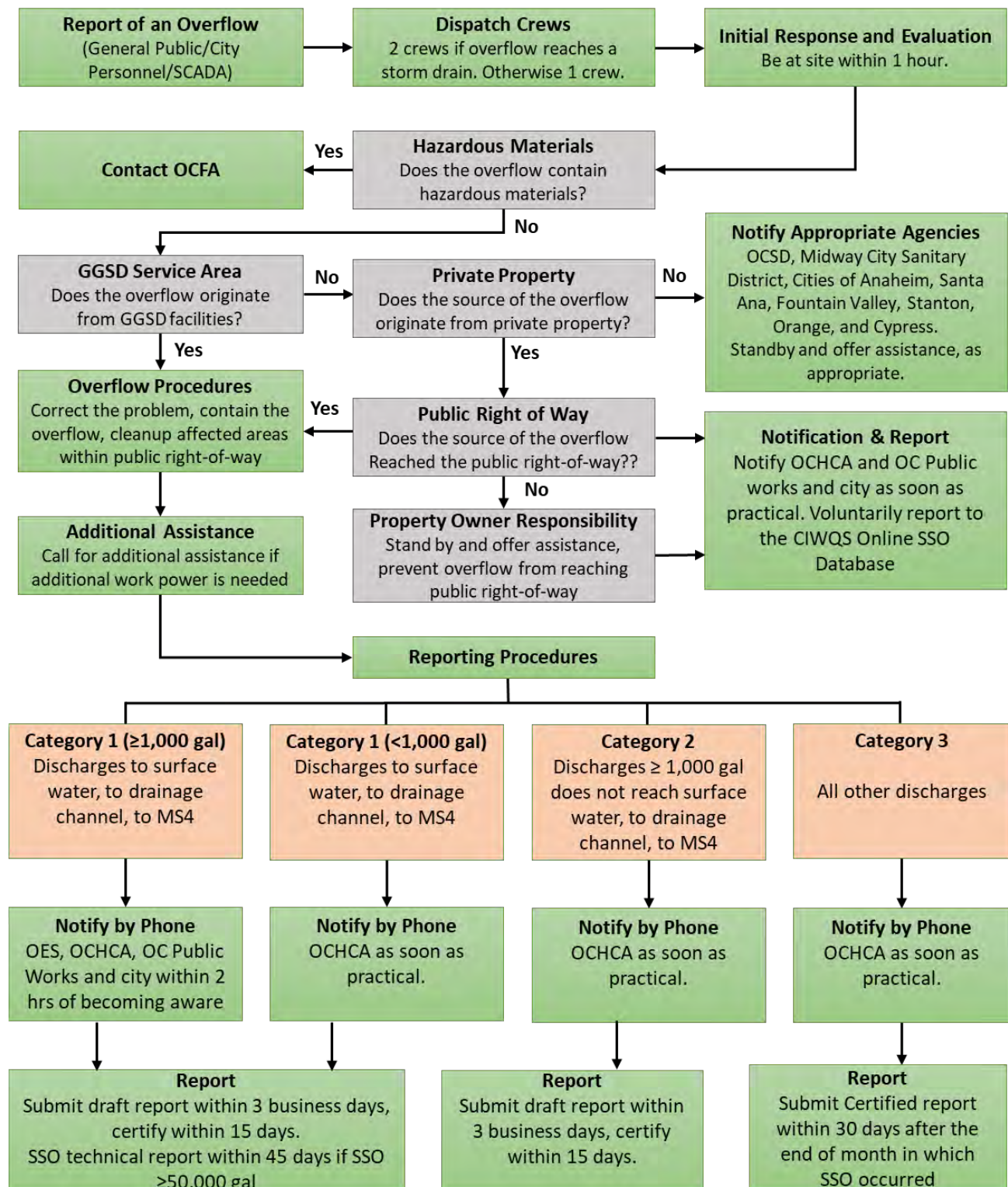
Figure 3-2
Operation and Maintenance Organization Chart



**Table 3-1
SSMP Responsibilities**

Task	Board of Directors/ District Manager	Water Services Manager	Sanitation Supervisor	Public Works Foreman	Field Crews
SSMP Development Plan and Schedule	Reviews, Approves				
Legal Authority	Reviews, Approves	Oversees			
Final SSMP Document	Reviews, Approves	Oversees			
Sewer Funding Plan	Reviews, Approves	Oversees			
Goals of SSMP	Implements	Oversees			
Organization of SSMP	Reviews, Approves	Oversees	Participates		
Up to Date Map of Collection System, Pumping Facilities, and Stormwater Conveyances		Oversees	Participates	Participates	
System Evaluation and Capacity Assurance Plan		Oversees	Participates		
Sewer System Rehabilitation Plan		Participates	Oversees	Participates	
FOG Outreach		Participates	Oversees	Participates	
Plan for FOG Disposal		Participates	Oversees	Participates	
FOG Source Control Measures		Participates	Oversees	Participates	
Design and Construction Standards		Oversees	Participates		
Procedures and Standards for Inspection and Testing		Oversees	Participates	Participates	
SSMP Monitoring		Participates	Participates	Participates	
SSMP Internal Audits		Oversees	Participates	Participates	
SSMP Program Updates			Participates	Participates	
SSMP Communication Program		Oversees			
Overflow Emergency Response Plan			Oversees	Participates	Implements
Operation and Maintenance Program		Participates	Oversees	Participates	Implements
CCTV Inspection and Condition Assessment			Oversees	Participates	
SSO Trend Maintenance			Oversees	Participates	
Staff Training Program			Oversees	Participates	
Equipment Inventory			Oversees	Participates	
Sanitary Sewer Overflows			Reports		
CIP Plans, Specifications, and Estimate Standards		Oversees			
Construction Management and Inspection Staff Work		Directs			

**Figure 3-3
SSOERP Response Procedures**



SECTION 4 LEGAL AUTHORITY

Order 2006-0003-DWQ requires that:

Each Enrollee must demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

- (a) Prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc);*
- (b) Require that sewers and connections be properly designed and constructed;*
- (c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;*
- (d) Limit the discharge of fats, oils, and grease and other debris that may cause blockages, and*
- (e) Enforce any violation of its sewer ordinances.*

Order 2006-0003-DWQ prohibits any SSO that results in a discharge of untreated or partially treated wastewater to the waters of the United States or that creates a nuisance as defined in California Water Code Section 13050(m).

Legal Authority is a very important component of a sewage collection agency's responsibility in regulating the usage of the sanitary sewer system.

4-1 COMPLIANCE

The District possesses legal authority through the following documents:

- Code of Regulations (Appendix C-1)
- Storm Water Quality Ordinance (Appendix C-2)
- Ordinance No. 6. FOG Control Ordinance (Appendix C-3)
- Design Criteria for Sewer Facilities (Appendix E-1)
- Sewer Standard Drawings (Appendix E-2)
- Standard Specifications for Public Works Construction (Greenbook)

These documents are located in Appendix C and E of this document, and are available at the Municipal Service Center. Electronically, these documents can be found on the City of Garden Grove's website:

<https://ggcity.org/pw>

Table 4-1 summarizes the District's relevant ordinance sections that correlate to the requirements.

Table 4-1: District Ordinances

	Waste Discharge Requirement	Legal Document	Section
a)	Prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc)	GGSD Code of Regulations	4.10.050 Discharge of objectionable materials- Regulations
			4.10.060 Discharge of corrosive harmful wastes
			4.10.070 Rain and surface water prohibited
			4.10.080 Automobile washing areas regulated
			4.10.090 Opening manhole prohibited
			4.10.100 Discharge into sewer manholes regulated
b)	Require that sewers and connections be properly designed and constructed	Design Criteria for Sewer Facilities, Sewer Standard Drawings, Greenbook	
c)	Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency	GGSD Ordinance No. 6	4.30.130 Inspection and Sampling Conditions
		GGSD Code of Regulations	6.20.010 Maintenance Inspections
d)	Limit the discharge of fats, oils, and grease and other debris that may cause blockages	GGSD Ordinance No. 6	4.30 Regulations for Controlling the Discharge of Fats, Oils and grease from food service establishments
e)	Enforce any violation of its sewer ordinance	GGSD Code of Regulations	6.20 Code Enforcement
		GGSD Ordinance No. 6	4.30.150 Enforcement

The City of Anaheim, the City of Orange, the City of Stanton, the City of Santa Ana, and the Midway City Sanitary District tie into the Garden Grove Sanitary District’s sewer system. The sewers within Unincorporated Orange County that are tributary to the District’s sewers are currently owned and maintained by the District. Appendix C-4 to Appendix C-8 include all current agreements that the District has with these satellite agencies.

The District has updated its agreement with the City of Stanton to comply with the regulations of Order 2006-0003-DWQ. There are ongoing discussions and communications with the City of Anaheim, the City of Orange, the City of Santa Ana, and the Midway City Sanitary District to ensure that all systems tributary to the Garden Grove Sanitary District’s sewer system are in compliance with the Waste Discharge Requirements.

A. ILLICIT DISCHARGES

Order 2006-0003-DWQ requires that the District have legal authority “to prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc)”

Illicit discharges are controlled by the Garden Grove Sanitary District’s Code of Regulations. The relevant sections include: Discharge of Objectionable Materials, Discharge of Corrosive Harmful Wastes, Rain and Surface Water Prohibited, and Discharge into Sewer Manholes Regulated. The District maintains the legal authority to prohibit illicit discharges.

B. DESIGN STANDARDS

Order 2006-0003-DWQ requires that the District have legal authority to “require that sewers and connections be properly designed and constructed.”

In 2015, the District updated the Design Criteria for Sewer Facilities (originally established and adopted in 2007), which includes the Standard Plans.

C. ACCESS TO FACILITIES

Order 2006-0003-DWQ requires that the District have legal authority to “*to ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained*” by the District.

Section 6.20.010 of the GGSD Code of Regulations states, “*The District may inspect as often as it deems necessary, every sewage pumping plant, sewage treatment plant, industrial liquid waste pretreatment plant, residential sewer, grease control device, dilution basin, neutralization basin, backwater trap or valve, or other similar appurtenance to ascertain whether such facilities are maintained and operated in accordance with the provision of this Code. All persons shall permit the District, City or their representatives, to have access to all such facilities at all reasonable times.*”

Section 4.30.130 of the District’s Municipal Code states, “*The owner shall allow the District access to the Food Service Establishment premises, during normal business hours, for purposes of inspecting the Food Service Establishment’s grease control devices or interceptor, reviewing the manifests, receipts and invoices related to cleaning, maintenance and inspection of the grease control devices.*”

These sections provide the District the legal authority to access the all sewer facilities, as well as access to Food Service Establishment (FSE) premises.

D. FATS, OILS, AND GREASE

Order 2006-0003-DWQ requires that the District have legal authority “*to limit the discharge of fats, oils, and grease and other debris that may cause blockages*”.

The District has the legal authority to manage the Fats, Oils, and Grease discharges through GGSD Ordinance No. 6 FOG Control Program document.

E. ENFORCEMENT

Order 2006-0003-DWQ requires that the District have legal authority “*to enforce any violation of its sewer ordinance*”.

Enforcement of sanitary sewer overflows (SSOs) is handled through Title 6 of the GGSD Code of Regulations and Section 4.30.150 of Ordinance No. 6. The District provides provisions for the issuance of administrative citations and cost recovery procedures to collect payment for resources utilized to contain and clean up areas affected by SSOs.

SECTION 5
OPERATION AND MAINTENANCE PROGRAM

Order 2006-0003-DWQ requires that:

The SSMP must include those elements listed below that are appropriate and applicable to the Enrollee's system:

- (a) Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities.*
- (b) Describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders.*
- (c) Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan.*
- (d) Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained.*
- (e) Provide equipment and replacement part inventories, including identification of critical replacement parts.*

5-1 COMPLIANCE

The very low spill rate indicates that the existing Operation and Maintenance Program has formed a solid foundation for the District. The District shows compliance with the Waste Discharge Requirements (WDR) through the following stand-alone documents:

Preventative Maintenance Plan

The District prepared a stand-alone Preventative Maintenance Plan document. This comprehensive report summarizes the District's Operation and Maintenance Program, which includes but is not limited to the following:

- WDR Description

- Training
- Sanitary Sewer System Map
- Sewer Inspections
- Condition Assessment
- Sewer Cleaning
- Pump Station Maintenance
- General Corrective Maintenance
- Equipment and Replacement Part Inventories
- Roving Check Program
- SSO Contractors
- Staff Assessment Program

Sewer System Rehabilitation Plan

The District has prepared a stand-alone document, the Sewer System Rehabilitation Plan, to evaluate and report on the condition of the District's gravity sewers. The Sewer System Rehabilitation Plan has been prepared in five phases, beginning in 2005 with the latest phase completed in 2013. All updates to the previous Sewer System Rehabilitation Plan are detailed within this report.

A. SANITARY SEWER SYSTEM MAP

Order 2006-0003-DWQ requires that the District “*maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable storm water conveyance facilities.*”

The District keeps up-to-date GIS files of its sewer and storm water facilities. The GIS is available on the City's intranet and is maintained by the City's Information Technology Division and the Water Services Division. The Water Services Division catalogues the plans, paper records, and all the database information that needs to be inputted into the GIS. Information for the following items is included in the GIS database:

- Pipes
- Manholes
- Hot Spot Log
- Inverted Siphons
- Pump Stations
- Force mains
- Storm Drains
- Catch Basins
- 5 foot contour data

To comply with the WDR requirements, the District has prepared the sewer and storm drain map, which is included in Appendix D-1. The map includes the street flow arrows and the drainage boundaries to each catch basin within the District's service area.

The District has produced hard copies of Appendix D-1, and they are available on the District's maintenance

trucks, along with the sewer atlas. The maps have also been included in the District's stand-alone Overflow Emergency Response Plan document.

B. ROUTINE PREVENTIVE OPERATION AND MAINTENANCE ACTIVITIES

Order 2006-0003-DWQ requires that the SSMP “describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance program should have a system to document scheduled and conducted activities, such as work orders.”

The Garden Grove Sanitary District maintains a Preventative Maintenance Plan (PMP). The PMP details the operation and maintenance activities implemented to minimize the risk of sanitary sewer overflows (SSOs).

The PMP states that, “The District uses a combination of staff and/or contractors to perform the planned maintenance tasks at scheduled frequencies as part of the District’s asset level of care program.”

Computer Maintenance Management System

The District manages its cleaning and maintenance activities through its Computerized Maintenance Management System (CMMS), a GIS Intranet program that tracks the maintenance activities, which includes but are not limited to the following:

- Work Orders
- Hot Spot Cleaning
- Manhole Inspections
- Pest Control
- Root Treatment
- Food Service Establishments
- Sewer Spill Locations
- Routine Cleaning
- Emergency Repairs
- CCTV Recording and Inspection Report
- Sewer Line Foaming
- Smart covers/Telog Tracking
- Grease Control Devices

The District’s current CMMS program was developed by its Information Technology (IT) Department. The database associated with the CMMS was first developed using the Munsys GIS software. The database was converted to Esri-based software in 2017. The CMMS provides the following:

- Automated graphical reporting (Routine Maintenance, Hot Spot Cleaning, CCTV, etc)
- Automated summary reports (Routine Maintenance, Hot Spot Cleaning, CCTV, etc)
- Links to CCTV videos and maintenance photos
- Automatic update of CCTV inspection to GIS shapefiles
- Link between sewer repair reports to sewer ID
- Pump Station work order documentation (future improvement)
- Vehicle work order documentation (future improvement)

Sewer Cleaning

The District maintenance crews are responsible for tracking the completed cleaning tasks by inputting the completed cleaning records into the computerized maintenance management system (CMMS). The District records the following information for all cleaning inspections:

- Maintenance Staff
- Percent Completed
- Grease
- Pipe Pieces
- CCTV
- Date
- Footage
- Roots
- Egg Shells
- Comments

The cleaning procedure consists of using a combination truck to hydraulically wash the pipe walls and vacuuming all detached debris at the downstream manhole. The District owns and operates three (3) combination trucks. Sewer cleaning consists of hydraulically washing the pipe walls, which is followed by the vacuum removal of all debris at the downstream manhole.

Routine Cleaning: The District's goal is to clean all lines within 18 to 24-months. Daily routine cleaning goals have been set at 3,800 feet of sewer per day, which will adhere to the 18-24 month schedule. The cleaning history is reviewed on a monthly basis to ensure that the cleaning target goals are being met.

Hot Spot Sewer Maintenance: The Hot Spot locations are summarized in Table 5-1 and illustrated on Figure 5-1. The District records the following information at each cleaning or inspection:

- Pipe ID
- Staff performing cleaning
- Date

The District has 262 reaches on its Hot Spot list that are scheduled to be cleaned to prevent blockages and spills.

The District has an additional 76 Hot Spot reaches that are manually inspected to evaluate if additional maintenance is required. These Hot Spot locations do not have significant maintenance issues, and frequent cleaning is not required at these locations. The District performs visual inspections of these reaches on a regular basis to monitor the condition of the sewer. A thorough cleaning will be performed if maintenance crews observe grease, roots, grit, or any other obstructions. Otherwise, these reaches will be cleaned on the routine maintenance schedule.

The District provides Hot Spot cleaning on the following intervals:

- Monthly (76 Reaches)
- Quarterly (63 Reaches)
- Semiannually (48 Reaches)
- Monthly – Inspection Only (52 Reaches)
- Quarterly – Inspection Only (12 Reaches)
- Semiannually – Inspection Only (11 Reaches)

**Table 5-1
Hot Spot Cleaning Inventory**

Previous Sewer ID	Existing Pipe ID	US MH	DS MH	Pipe Size	Material	Length	Location	Hot Spot Cleaning Frequency
SPD110002	1440	7818	7825	8	VC	258	Tiffany Lift Station	Monthly
SPD110026	1940	7943	7818	8	VC	258	Tiffany Lift Station	Monthly
SPD120002	1551	7949	7950	12	VC	300	Tiffany Lift Station	Monthly
SPD120003	1552	7950	7951	12	VC	158	Tiffany Lift Station	Monthly
SPD120004	1553	7951	7952	12	VC	268	Tiffany Lift Station	Monthly
SPD120007	1584	7955	7951	8	VC	216	Tiffany Lift Station	Monthly
SPD120009	1586	7957	7958	8	VC	220	Tiffany Lift Station	Monthly
SPD120010	1587	7958	7952	8	VC	298	Tiffany Lift Station	Monthly
SPD120013	1715	7952	7820	12	VC	259	Tiffany Lift Station	Monthly
SPD120014	1942	7960	7820	8	VC	217	Tiffany Lift Station	Monthly
SPE080021	1735	8895	8896	8	VC	365	Chapman/Stonegate	Monthly
SPE080022	1736	8896	8899	8	VC	60	Chapman/Stonegate	Monthly
SPE080024	1338	8906	8907	8	VC	163	Chapman/Bailey	Monthly
SPE090017	1340	8908	8909	8	VC	320	Bailey/Laurelton	Monthly
SPE090018	1341	8909	8910	8	VC	320	Bailey/Laurelton	Monthly
SPE090019	1342	8910	7780	8	VC	122	Bailey/Laurelton	Monthly
SPE110039	1439	7817	7818	8	VC	350	Tiffany Lift Station	Monthly
SPE110044	1445	0	0	8	VC	350	Tiffany Lift Station	Monthly
SPE110045	1446	7825	7827	8	VC	127	Tiffany Lift Station	Monthly
SPE110046	1447	0	0	8	VC	318	Tiffany Lift Station	Monthly
SPE110047	1793	7827	7828	12	VC	160	Tiffany Lift Station	Monthly
SPE120026	1794	7828	7829	12	VC	296	Tiffany Lift Station	Monthly
SPE120030	2120	8670	8669	10		390	Tiffany Lift Station	Monthly
SPE120031	2119	8669	7902	10		400	Tiffany Lift Station	Monthly
SPH110013	1732	8157	8177	18	VC	370	Industry South of Lampson	Monthly
SPJ080029	2418	8593	8596	8	VC	310	8121 Filmore	Monthly
SPJ110047							Lampson West of Dale (School District)	Monthly
SPK080046	2094	8509	8510	8	VC	195	Dale/Twana	Monthly
SPK080047	1996	8510	8512	8	VC	37	Dale/Twana	Monthly
SPK130003	3217	0	0	8	VC	10	Garden Grove Blvd/Yockey	Monthly
SPK130018	3218	9360	9381	8	VC	240	Garden Grove Blvd/Yockey	Monthly
SPK130044							Central/Wilson	Monthly
SPK140029	703	7665	8608	12	XS VC	250	Newland/Trask	Monthly
SPK150020	832	7644	7666	8	VC	330	Newland/Trask	Monthly
SPL120021	3147	8486	8487	8	VC	345	Magnolia to Hazel	Monthly
SPL130024	3158	8498	9359	8	VC	349	Garden Grove Blvd/Hazel	Monthly
SPL130025	3165	9359	9360	8	VC	248	Garden Grove Blvd/Hazel	Monthly
SPM090038	5164	10378	10379	8	VC	225	Vons Complex	Monthly

Table 5-1 (Continued)
Hot Spot Cleaning Inventory

Previous Sewer ID	Existing Pipe ID	US MH	DS MH	Pipe Size	Material	Length	Location	Hot Spot Cleaning Frequency
SPM120005	2818	11333	11337	10	VC	300	Garden Grove/Brookhurst Way	Monthly
SPM120014	2657	11548	14484	8	VC	312	Garden Grove Blvd/Galway	Monthly
SPM130004							Garden Grove Blvd/Galway	Monthly
SPM160014	2206	0	0	8	VC	310	Westminster/Erin	Monthly
SPM200009	222	6929	6932	8	VC	263	Lexington/Donegal	Monthly
SPM200010	223	6930	6931	8	VC	257	Lexington/Donegal	Monthly
SPM200011	224	6931	6932	8	VC	264	Lexington/Donegal	Monthly
SPM200013	226	6933	6934	8	VC	371	Bolsa/Bushard Alley	Monthly
SPM200014	227	6934	6935	8	VC	86	Bolsa/Bushard Alley	Monthly
SPM200017	232	6939	6940	8	VC	208	Bolsa/Bushard Alley	Monthly
SPM200018	233	6940	6935	8	VC	376	Bolsa/Bushard Alley	Monthly
SPN130028	2896	11297	11298	8	VC	340	Flower/Central	Monthly
SPN130033	2937	11338	11337	8	VC	187	Garden Grove/Brookhurst Way	Monthly
SPN140037	3084	10708	11298	8	VC	360	Flower/Central	Monthly
SPN170002	46	6975	7264	8	VC	390	Morningside/Hope	Monthly
SPN170005	135	7296	7264	8	VC	258	Morningside/Flood Control Channel	Monthly
SPN170007	137	7264	7265	12	XS VC	151	Jennrich/DeanAnn	Monthly
SPN170016	2259	10515	10516	8	VC	90	Brookhurst/15th	Monthly
SPN170032	2019	10396	10526	8	VC	477	Brookhurst/15th	Monthly
SPN170033	3029	10526	10527	8	VC	320	Brookhurst North of 15th	Monthly
SPN170042	2468	10516	10526	8	VC	350	Brookhurst/15th	Monthly
SPN180002	139	7266	7267	8	VC	133	Jennrich/DeanAnn	Monthly
SPN190007	9245	7295	15303	10	VC	383	Hazard West of Lyndon	Monthly
SPN190007	9246	15303	6893	10	VC	383	Hazard West of Lyndon	Monthly
SPO120027	9243	12310	15302	6	VC	295	Pearl/Nelson	Monthly
SPO120027	9244	15302	12268	6	VC	290	Pearl/Nelson	Monthly
SPO130024	4927	12288	12289	8	VC	40	Century South of Garden Grove Blvd (Double Barrel Siphon)	Monthly
SPO200014	113	6780	6887	8	VC	114	Bolsa/Ward	Monthly
SPO200024	179	6887	7301	8	VC	330	Bolsa/Ward	Monthly
SPP130043	5294	11823	11738	8	VC	265	Garden Grove Blvd/Lincoln	Monthly

**Table 5-1 (Continued)
Hot Spot Cleaning Inventory**

Previous Sewer ID	Existing Pipe ID	US MH	DS MH	Pipe Size	Material	Length	Location	Hot Spot Cleaning Frequency
SPR090031	5473	0	0	6	VC	115	Buaro/Jentges/Puryear	Monthly
SPR090032	5474	11696	11697	6	VC	185	Buaro/Jentges/Puryear	Monthly
SPR090035	5479	11697	12200	6	VC	340	Buaro/Jentges/Puryear	Monthly
SPS090021	5832	12138	12139	8	VC	320	Harbor South of Chapman	Monthly
SPS090022	5833	12139	12140	8	VC	320	Harbor South of Chapman	Monthly
SPS090023	5834	12140	12116	8	VC	257	Harbor South of Chapman	Monthly
SPN180001	138	7265	7266	8	VC	95	Jennrich/DeanAnn	Monthly
COL030001							Gilbert/Pacific	Monthly
SPJ110012	1817	8697	8698	8	VC	299	Lampson/School District	Quarterly
SPJ110020	1823	8698	8701	8	VC	338	Lampson/School District	Quarterly
SPJ120020	748	7715	7719	8	VC	297	Garden Grove Blvd/Fern	Quarterly
SPJ130005	783	7718	7719	8	VC	331	Garden Grove Blvd/Fern	Quarterly
SPK080006	3882	10297	10298	8	VC	250	MacNab/MacAlpine (Double Barrel Siphon)	Quarterly
SPK080007	3883	10298	10308	8	VC	35	MacNab/MacAlpine (Double Barrel Siphon)	Quarterly
SPK090038	1803	8533	8534	8	VC	300	Dale/Amy	Quarterly
	1804	8534	8535	8	VC	307	(Double Barrel Siphon) to Amy	Quarterly
SPK090040	1805	8535	8536	8	VC	170	Dale/Chapman (Double Barrel Siphon)	Quarterly
SPK090041	7050	13569	8520	8	VC	38	Dale/Chapman (Double Barrel Siphon)	Quarterly
SPK090041	7051	8536	13570	8	VC	38	Dale/Chapman (Double Barrel Siphon)	Quarterly
SPK090041	7052	13570	13569	8	VC	38	Dale/Chapman (Double Barrel Siphon)	Quarterly
SPK110001	3346	8375	8376	8	VC	344	Josephine North of Garden Grove Blvd	Quarterly
SPK110002	3347	8376	8377	8	VC	350	Josephine North of Garden Grove Blvd	Quarterly

**Table 5-1 (Continued)
Hot Spot Cleaning Inventory**

Previous Sewer ID	Existing Pipe ID	US MH	DS MH	Pipe Size	Material	Length	Location	Hot Spot Cleaning Frequency
SPK110003	3348	8377	8378	8	VC	350	Josephine North of Garden Grove Blvd	Quarterly
SPK120003	3349	8378	8390	8	VC	348	Josephine North of Garden Grove Blvd	Quarterly
SPK120008	3364	8390	8393	8	VC	332	Josephine North of Garden Grove Blvd	Quarterly
SPK120011	3367	8393	8399	8	VC	325	Josephine North of Garden Grove Blvd	Quarterly
SPK120017	3373	8399	8400	8	VC	165	Josephine North of Garden Grove Blvd	Quarterly
SPK120018	3374	8400	8402	8	VC	317	Josephine North of Garden Grove Blvd	Quarterly
SPL070007	5190	10138	10139	8	VC	210	OCTD/Shannon (Double Barrel):	Quarterly
SPL160025	6694	13318	13319	8	VC	0	Magnolia North of Westminster (Alley)	Quarterly
SPL160026	6692	13317	13318	8	VC	0	Magnolia North of Westminster (Alley)	Quarterly
SPM090002	4989	9663	9960	8	VC	172	Brookhurst/Chapman Cleanouts	Quarterly
SPM130026	2344	11082	10777	6	VC	361	Easement North of Belfast	Quarterly
SPM130027	2345	10777	10762	6	VC	200	Belfast/Donegal	Quarterly
SPN110002	2378	11141	11142	8	VC	55	Nutwood/Kensington	Quarterly
SPN110003	2379	11142	11143	8	VC	100	Nutwood/Kensington	Quarterly
SPN110008	2540	11253	11254	8	VC	320	Nutwood/Lampson	Quarterly
SPN110020	2919	11254	11137	8	VC	310	Nutwood/Lampson	Quarterly
SPN110021	2920	11259	11143	8	VC	150	Nutwood/Kensington	Quarterly
SPN120024	2931	11325	11326	8	VC	80	Stanford/Brookhurst	Quarterly
SPN130022	2890	11071	11289	6	VC	410	Crosby/Hope	Quarterly
SPN140020	7521	11314	11315	10	XS VC	0	Trask/Hope	Quarterly
SPO100019	2386	11209	11210	8	VC	273	Lampson/McLeod	Quarterly
SPO100020	2387	11210	11147	8	VC	270	Lampson/McLeod	Quarterly
SPO110024	2372	11147	11136	8	VC	180	Nutwood/Lampson	Quarterly
SPO110025	2373	11136	11137	8	VC	300	Nutwood/Lampson	Quarterly
SPO160024	4620	11002	10983	8	VC	255	Taft/Linnell	Quarterly
SPP120024	4623	11892	11893	6	VC	321	Garden Grove Blvd/Euclid	Quarterly
SPP130027	4444	11893	11894	10	VC	65	Garden Grove Blvd/Euclid	Quarterly
SPP130029	4447	11895	11896	12	VC	20	Garden Grove Blvd/Euclid	Quarterly
SPP130045	4446	12314	11893	10	VC	200	Garden Grove Blvd/Euclid	Quarterly
SPP160034	5993	10966	10968	8	VC	306	Blake Alley	Quarterly
SPP160035	5994	10967	10968	8	VC	325	Blake Alley	Quarterly

**Table 5-1 (Continued)
Hot Spot Cleaning Inventory**

Previous Sewer ID	Existing Pipe ID	US MH	DS MH	Pipe Size	Material	Length	Location	Hot Spot Cleaning Frequency
SPP160036	5995	10968	10969	8	VC	380	Linnell/Fernwood	Quarterly
SPP160040	5999	10972	11002	8	VC	194	Taft/Linnell	Quarterly
SPR150012	592	7541	7542	12	VC	260	Harbor/Cardinal	Quarterly
SPR150013	593	7542	7543	12	VC	32	Harbor/Cardinal	Quarterly
SPR150014	847	7543	7544	12	VC	80	Harbor/Cardinal	Quarterly
SPS130015	559	6738	6739	8	VC	316	Blackbird/Pearce	Quarterly
SPS130016	560	6739	6740	8	VC	71	Blackbird/Pearce	Quarterly
SPS140031	561	6740	6743	8	VC	479	Blackbird/Pearce	Quarterly
SPS140034	595	6743	6744	8	VC	227	Clinton/Pearce	Quarterly
SPS140035	596	6744	6745	8	VC	90	Clinton/Pearce	Quarterly
SPS140036	597	6745	6746	8	VC	33	Clinton/Pearce	Quarterly
SPS140037	598	6746	6760	8	VC	184	Clinton/Pearce	Quarterly
SPS160010	456	7473	7474	8	VC	126	Roxy/Westminster	Quarterly
SPS160011	457	7474	7475	8	VC	70	Roxy/Westminster	Quarterly
SPS160012	458	7475	7477	8	VC	75	Roxy/Westminster	Quarterly
SPS160015	461	7477	7478	8	VC	134	Roxy/Westminster	Quarterly
SPT140020	7765	6674	14124	6	VC	435	Trask/Ranchero Way	Quarterly
SPT140021	7777	6675	14130	8	VC	287	Trask/Ranchero Way	Quarterly
MHR110027							West/Emrys	Quarterly
	5563	10613	10614	8	VC	350	Palma Vista	Quarterly
MHK130015							Yockey South of Oakdale	Semiannually
MHS170013							Buena/Morningside from Mar Les	Semiannually
SPE090002	1147	7854	7857	8	VC	294	Belgrave Lift Station	Semiannually
SPE090010	1741	8860	7787	8	VC	190	Valley View to Emerald	Semiannually
SPE090021	2096	8912	8913	10	VC	335	Belgrave Lift Station	Semiannually
SPE090023	1347	8652	8653	12	VC	197	Belgrave Lift Station	Semiannually
SPE090024	2098	8653	8918	12	VC	200	Belgrave Lift Station	Semiannually
SPE090029	1392	7779	7780	8	VC	141	Belgrave Lift Station	Semiannually
SPE090030	1393	7780	8652	8	VC	325	Belgrave Lift Station	Semiannually
SPE090040	1795	7856	7857	12	VC	350	Belgrave Lift Station	Semiannually
SPE090041	1796	7857	7880	12	VC	260	Belgrave Lift Station	Semiannually
SPE090047	1527	7871	7881	8	VC	328	Belgrave Lift Station	Semiannually
SPE090051	1535	0	0	8	VC	290	Belgrave Lift Station	Semiannually
SPE090052	1797	7880	7881	12	VC	258	Belgrave Lift Station	Semiannually
SPE090053	1959	8651	8652	8	VC	169	Belgrave Lift Station	Semiannually
SPE090054	1960	7881	8653	12	VC	258	Belgrave Lift Station	Semiannually
SPE100009	1746	7783	8862	10	VC	188	Belgrave Lift Station	Semiannually
SPE100010	1747	8862	8863	10	VC	90	Belgrave Lift Station	Semiannually
SPE100011	2128	8863	8864	10	VC	205	Belgrave Lift Station	Semiannually
SPE100012	2099	8864	8865	10		215	Belgrave Lift Station	Semiannually
SPE100013	2100	0	0	10		530	Belgrave Lift Station	Semiannually
SPE100014	2101	8866	8913	10	VC	210	Belgrave Lift Station	Semiannually
SPE100017	1503	8869	8862	8	VC	220	Belgrave Lift Station	Semiannually
SPE100034	1415	7796	8648	8	VC	260	Belgrave Lift Station	Semiannually

Table 5-1 (Continued)
Hot Spot Cleaning Inventory

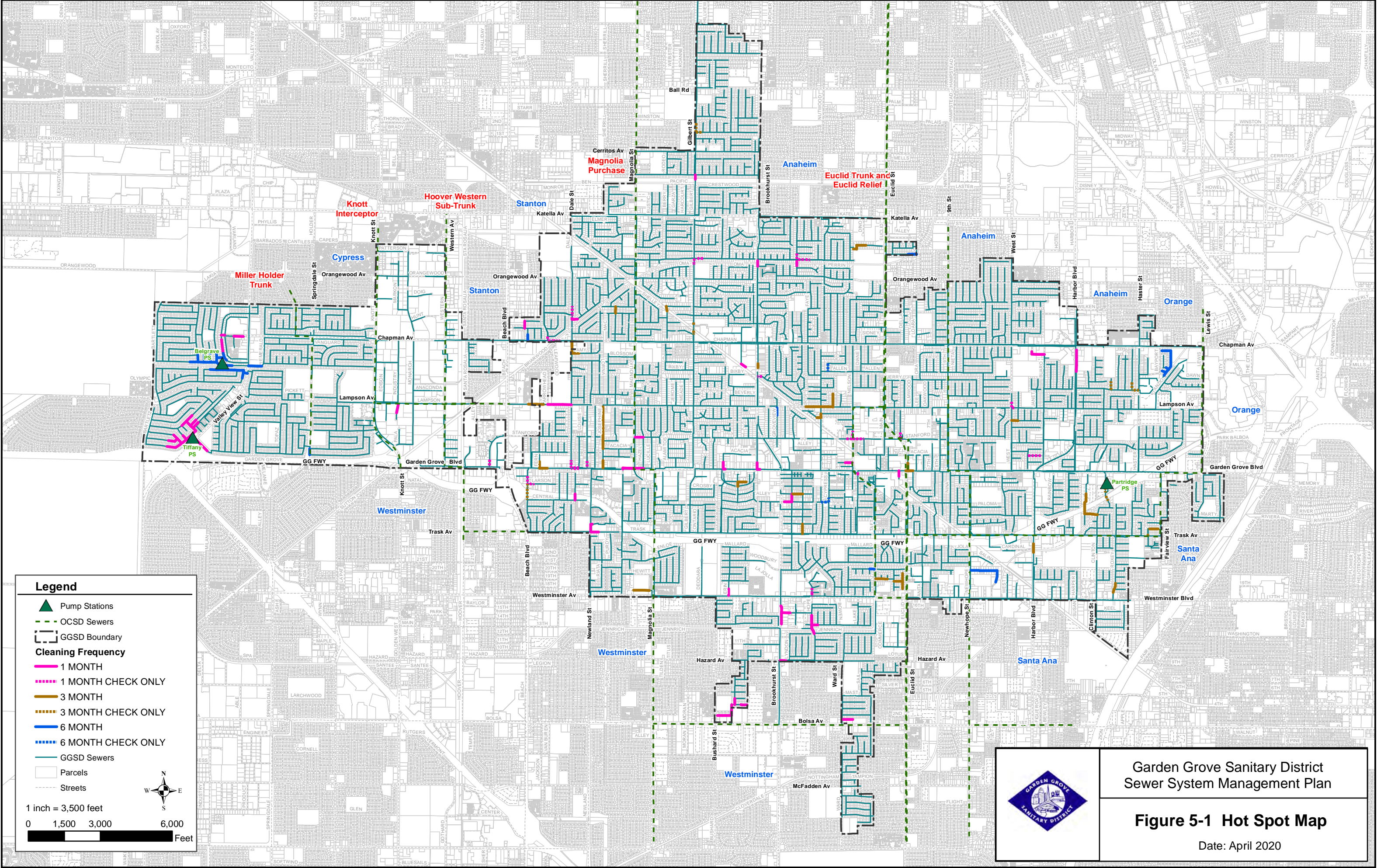
Previous Sewer ID	Existing Pipe ID	US MH	DS MH	Pipe Size	Material	Length	Location	Hot Spot Cleaning Frequency
SPE100053	1954	0	0	8	VC	260	Belgrave Lift Station	Semiannually
SPF090045	1496	8857	8858	8	VC	21	Valley View to Emerald	Semiannually
SPF090049	1500	8858	8860	8	VC	268	Valley View to Emerald	Semiannually
SPF120001	1218	7406	7407	8	VC	260	Seneca from Acacia to Anthony	Semiannually
SPJ080034	2423	8598	13535	8	VC	240	Chapman/Arthur	Semiannually
SPN110029	2620	10685	10686	8	VC	322	Groveview South of Lampson	Semiannually
SPO160010	6014	10991	10992	8	VC	210	Taft/Blake	Semiannually
SPP060004	6607	12791	13157	8	VC	192	Wakefield/Euclid	Semiannually
SPP060008	6599	13167	12791	8	VC	157	Wakefield/Euclid	Semiannually
SPQ160001	3710	10926	11444	8	VC	385	Newhope/Anabel	Semiannually
SPQ160015	3851	11444	10870	8	VC	385	Newhope/Anabel	Semiannually
SPQ160020	4857	11438	10924	8	VC	100	Better Way	Semiannually
SPQ160022	4859	10925	10926	8	VC	405	Newhope/Anabel	Semiannually
SPQ160024							Better Way	Semiannually
SPT090003	5256	12628	12629	8	VC	200	Bayport Alley/Allard	Semiannually
SPT090004	5257	12629	12630	8	VC	245	Bayport Alley/Allard	Semiannually
SPT090005	5258	12630	12631	8	VC	200	Bayport Alley/Allard	Semiannually
SPT090006	5259	12631	12632	8	VC	165	Bayport Alley/Allard	Semiannually
SPT090027	4028	12674	12843	8	VC	180	Bayport Alley/Allard	Semiannually
SPT090031	4032	12846	12845	8	VC	185	Bayport Alley/Allard	Semiannually
SPT090032	4033	12845	12678	8	VC	150	Bayport Alley/Allard	Semiannually
SPT090041	6537	12843	12628	8	VC	200	Bayport Alley/Allard	Semiannually
SPT090042	6538	12844	12632	8	VC	120	Bayport Alley/Allard	Semiannually
SPT090043	6539	12632	12845	8	VC	150	Bayport Alley/Allard	Semiannually
SPI120011	1004	7151	7152	8	VC	290	Garden Grove Blvd/Village	Monthly - Inspection Only
SPI130002							Garden Grove Blvd/Village	Monthly - Inspection Only
SPI130003							Garden Grove Blvd/Village	Monthly - Inspection Only
SPI130006							Garden Grove Blvd/Hoover	Monthly - Inspection Only
SPI130012							Garden Grove Blvd/Hoover	Monthly - Inspection Only
SPJ080020	7090	13590	13554	8	VC	180	Chapman/Nearing	Monthly - Inspection Only
SPJ090002	6995	13548	13547	8	VC	175	Chapman/Nearing	Monthly - Inspection Only
SPJ090003	6991	13546	13545	8	VC	90	Chapman/Nearing	Monthly - Inspection Only
SPJ090004	6987	13544	13541	8	VC	255	Chapman/Nearing	Monthly - Inspection Only
SPJ130023	843	7105	7106	15	XS VC	333	Coast/Larson	Monthly - Inspection Only
SPJ130031	759	7058	7106	8	XS VC	270	Coast/Larson	Monthly - Inspection Only
SPK080049	7085	8512	0	8	VC	210	Dale/Augusta	Monthly - Inspection Only
SPK080050	2001	8515	8516	8	VC	365	Dale/Augusta	Monthly - Inspection Only

**Table 5-1 (Continued)
Hot Spot Cleaning Inventory**

Previous Sewer ID	Existing Pipe ID	US MH	DS MH	Pipe Size	Material	Length	Location	Hot Spot Cleaning Frequency
SPK130035	707	7669	7670	8	VC	334	Garden Grove	Monthly - Inspection Only
SPK140027	701	7663	7664	8	VC	330	Newland/Gloria	Monthly - Inspection Only
SPK140028	702	7664	7665	8	VC	25	Newland/Gloria	Monthly - Inspection Only
SPK140037							Newland/Gloria	Monthly - Inspection Only
SPL060002	4699	10103	10108	8	VC	300	Gilbert/Joyzelle	Monthly - Inspection Only
SPL060004	6854	13428	13429	10	VC	105	Gilbert/Oma	Monthly - Inspection Only
SPL060005	6856	10109	0	10	VC	100	Gilbert/Oma	Monthly - Inspection Only
SPL060006	4163	10110	10111	10	VC	75	Gilbert/Oma	Monthly - Inspection Only
SPN100045	3191	9455	9456	8	VC	170	Brookhurst/Bonser	Monthly - Inspection Only
SPN130003							Garden Grove Blvd/Rosewood	Monthly - Inspection Only
SPN160008	2188	10474	10475	8	VC	185	Westminster/Dawson	Monthly - Inspection Only
SPN160009	2189	10475	10468	8	VC	130	Westminster/Dawson	Monthly - Inspection Only
SPO110012	6845	12275	13424	8	VC	330	Stanford/Nelson	Monthly - Inspection Only
SPO120003	5395	11832	11834	8	VC	460	Stanford/Westlake	Monthly - Inspection Only
SPO120025	4432	12309	11832	8	VC	270	Stanford/Nelson	Monthly - Inspection Only
SPO130029							Garden Grove Blvd/Nelson	Monthly - Inspection Only
SPO140048							Cypress/Luders (Double Barrel)	Monthly - Inspection Only
SPP110026	4397	11742	11743	8	VC	85	Euclid/Pinehurst Apartments	Monthly - Inspection Only
SPP110032	4630	0	0	6	VC	135	Euclid/Pinehurst Apartments	Monthly - Inspection Only
SPP110033	4631	0	0	6	VC	140	Euclid/Pinehurst Apartments	Monthly - Inspection Only
SPQ100023	6164	11681	11672	8	VC	298	West/Lampson	Monthly - Inspection Only
SPR100037	5689	11671	11672	10	VC	75	West/Lampson	Monthly - Inspection Only
SPR120024	6092	11661	11665	8	VC	280	Dungan/Acacia	Monthly - Inspection Only
SPR120039	6467	12158	11661	8	VC	275	Dungan/Acacia	Monthly - Inspection Only
SPN060022	6139	9895	9896	8	VC	145	Palmwood/Parliament	Monthly - Inspection Only
SPN060023	6140	9896	9897	8	VC	90	Palmwood/Parliament	Monthly - Inspection Only
SPN060024	4865	9897	14803	8	VC	115	Palmwood/Parliament	Monthly - Inspection Only
SPN060025	8632	14823	14824	8	VC	280	Palmwood/Parliament	Monthly - Inspection Only
SPN060026	8628	14825	14826	8	VC	280	Palmwood/Parliament	Monthly - Inspection Only
SPN060030	4871	9903	9904	8	VC	265	Palmwood/Parliament	Monthly - Inspection Only
SPK120030	3404	0	0	8	VC	353	Garden Grove Blvd/Adelle	Monthly - Inspection Only

Table 5-1 (Continued)
Hot Spot Cleaning Inventory

Previous Sewer ID	Existing Pipe ID	US MH	DS MH	Pipe Size	Material	Length	Location	Hot Spot Cleaning Frequency
SPK120040	3421	8442	8443	8	XS VC	317	Garden Grove Blvd/Dale (Old Line)	Monthly - Inspection Only
SPK130022	3412	8434	8443	8	VC	325	Garden Grove Blvd/Dale (Old Line)	Monthly - Inspection Only
SPS100006	8793	12708	14928	8	XS VC	308	Twintree/Firebrand	Monthly - Inspection Only
SPS100006	8794	14928	12709	8	PVC	20	Twintree/Firebrand	Monthly - Inspection Only
SPS100030	5651	12644	12709	15	XS VC	285	Twintree/Firebrand	Monthly - Inspection Only
SPS100011	8783	12713	14922	15	XS VC	271	Twintree/Oertley	Monthly - Inspection Only
SPS100011	8784	14922	12716	16	PVC	20	Twintree/Oertley	Monthly - Inspection Only
SPS100013	8781	12715	12716	8	VC	365	Twintree/Oertley	Monthly - Inspection Only
SPJ130024	772	7106	13418	15	VC	191	Coast/Central	Quarterly - Inspection Only
SPJ130025	773	7107	7108	18	XS VC	460	Coast/Central	Quarterly - Inspection Only
SPL020001	3961	9338	9339	10	VC	375	Gilbert/Chanticleer	Quarterly - Inspection Only
SPL020006	3487	9346	9339	8	VC	290	Gilbert/Chanticleer	Quarterly - Inspection Only
SPL080002	7492	13904	13903	15	XS VC	0	Gilbert/Cellini	Quarterly - Inspection Only
SPL080003	7491	13903	13902	15	XS VC	0	Gilbert/Cellini	Quarterly - Inspection Only
SPL080003	7498	13899	13898	10	VC	270	Gilbert/Cellini	Quarterly - Inspection Only
SPL080004	7500	13897	13896	10	VC	65	Gilbert/Cellini	Quarterly - Inspection Only
SPS130004	519	6694	6695	8	VC	313	Partridge/Gloria	Quarterly - Inspection Only
SPS130005	8375	6695	14605	8	VC	313	Partridge/Gloria	Quarterly - Inspection Only
SPS130006	521	14603	6697	8	VC	193	Partridge/Gloria	Quarterly - Inspection Only
SPS130007	8392	14623	6700	8	VC	213	Partridge/Gloria	Quarterly - Inspection Only
SPN120021	2930	11322	11324	8	VC	338	Stanford/Blackthorn to Groveview	Semiannually - Inspection Only
SPO090036	2573	11154	11213	8	VC	335	Mockingbird North of Allen	Semiannually - Inspection Only
SPO130049	2489	11173	11193	8	VC	180	Cypress/Central	Semiannually - Inspection Only
SPO140033	2492	11176	11193	6	VC	320	Cypress/Central	Semiannually - Inspection Only
SPO120012							Grove South of Acacia	Semiannually - Inspection Only
SPQ000025							Edinger/Harbor to Newhope	Semiannually - Inspection Only
SPQ000026							Edinger/Harbor to Newhope	Semiannually - Inspection Only
SPQ000027							Edinger/Harbor to Newhope	Semiannually - Inspection Only
SPR000025							Edinger/Harbor to Newhope	Semiannually - Inspection Only
SPR000026							Edinger/Harbor to Newhope	Semiannually - Inspection Only
SPR000027							Edinger/Harbor to Newhope	Semiannually - Inspection Only



Legend


- Pump Stations
- OCSD Sewers
- GGSD Boundary

Cleaning Frequency

- 1 MONTH
- 1 MONTH CHECK ONLY
- 3 MONTH
- 3 MONTH CHECK ONLY
- 6 MONTH
- 6 MONTH CHECK ONLY
- GGSD Sewers
- Parcels
- Streets

1 inch = 3,500 feet

0 1,500 3,000 6,000 Feet



Garden Grove Sanitary District
Sewer System Management Plan

Figure 5-1 Hot Spot Map

Date: April 2020

The Hot Spot list is adjusted, as necessary, based on the following historical information gathered for each sewer:

- Sanitary sewer overflow
- Blockages observed from routine maintenance
- Maintenance records of grease, roots, debris from CCTV records
- Odor complaints

CCTV inspections for the reaches listed in Table 5-2 identify the presence of sags, grease, deposits, and other defects may cause spills in the future. These locations are re-inspected within six months following an initial cleaning effort to determine if these reaches should be added to the Hot Spot list. Per the recommendations of the 2011 SSMP Audit, the District reviewed sewers that were identified with similar types of defects from CCTV inspections performed prior to the 2011 SSMP Audit. The District evaluated adding these sewers to the Hot Spot list. The District's comments are summarized in Table 5-2.

The cleaning frequency of Hot Spot reaches may be reduced when the District staff verifies that the increased hot spot cleaning frequencies are unnecessary. The District will review CCTV inspections, visual inspections, and cleaning records to determine if the potential for obstructions are no longer relevant and the cleaning frequency may be reduced.

Root Control Program: Root intrusion was the highest priority maintenance issue identified in the Sewer System Rehabilitation Plan. The District hires a state certified and insured contractor for pesticide application to perform its root control services, which consists of a root control foaming agent that is applied every two (2) years. The District has specified the foaming agent Razorooter II or equivalent. The contractor is required to re-treat a sewer or refund 100% of the payment for the services if roots reappear in the treated sewers within six months or if there is a sanitary sewer overflow that resulted from root obstructions within 2 years of treatment.

The sewers, included in the root control program, are managed by the CMMS program. There are currently 154 reaches on the root control program, which are illustrated on Figure 5-2 and detailed in Table 5-3.

Reaches identified to be evaluated as addition to the program are also included on Figure 5-2. Table 5-3 includes all reaches that were identified through CCTV inspections with root balls in the main and/or lateral. These locations will be re-inspected within one year following an initial cleaning to determine if these reaches should be added to the root treatment list.

Food Service Establishment Inspection

The District staff performs annual inspections of its food service establishments (FSEs) to ensure that they are in compliance with the District's Fats Oils and Grease (FOG) Control Program. The inspections may be conducted during normal business hours at the consent of the owner or with an administrative inspection warrant. The District evaluates the best management practices (BMP) regarding a variety of maintenance activities. In regards to proper FOG disposal, the District evaluates the eating and drinking establishment requirements, the waste handling and disposal requirements, and the spill prevention and control requirements. See Section 8 of this report for further information regarding the District's FOG Control Program.

**Table 5-2
Sags, Grease, Deposits, and Obstacles**

Previous Sewer ID	Sewer ID	US MH	DS MH	Sags No of Joints	Grease - No of Joints	Deposits No of Joints	Obstacles Highest Percentage	Hot Spot Duration	Existing Root Treatment Reach	Recommendation from 2011 Hot Spot Evaluation
SPE080025	1343	8915	8914		15	99	0			
SPE080033	1403	8914	7788		22	78	0			
SPE080034	1449	7839	7838	22	0	117	0			
SPE090002	1147	7854	7857		81	34	0	Semiannual		
SPE090003	1148	7852	7854		83	40	0			
SPG090032	1471	7330	7331	0	0	112	0			
SPG090052	1172	7350	7357	0	60	98	0			
SPJ080033	2422	8597	8598	18	64	60	20			
SPJ090008	6966	13533	13532	24	98	9	30			
SPJ110009	1814	8694	8695	0	140	0	0			
SPJ140007	798	7060	7059	0	0	1	90			
SPJ140037				0	1	0	50			
SPK050040	1905	8054	8053	0	0	1	50			
SPL000008	3458	9304	9283	0	99	22	0			
SPL010001	3467	9319	9287	0	94	75	0			
SPL010004	3958	0	0	0	159	2	0			
SPL010005	3959	9325	9326	0	159	2	0			
SPL010006	3960	9326	9115	0	159	2	0			
SPL020007	4059	9115	9338	0	159	2	0			
SPL020008	3493	9353	9341	0	121	66	0			
SPL030002	3653	8939	9343	0	141	0	0			
SPL030005	3659	8947	8944	0	90	21	0			
SPL030006	3665	8953	8942	0	125	48	0			
SPL040006	3674	8964	8963	0	196	45	0			
SPL050019	4066	9015	9014	0	75	70	0			
SPL050020	4067	9015	8333	0	76	73	0			
SPL050029	4071	9631	9632	0	85	33	0			
SPL050030	4072	9632	9633	0	85	33	0			
SPL050031	4073	9634	9633	0	85	49	0			
SPL080035	4725	10806	9645	5	82	44	50			
SPL080039	5942	10141	10793	0	0	32	50			
SPL090024	7455	13876	13868	0	52	57	5			
SPL090025	7444	13868	13867	0	109	109	5			
SPL990003	3680	9280	9279	0	100	0	0			
SPL990007	3444	9289	9279	0	106	6	0			
SPM000001	3455	9304	9303	8	98	26	0			
SPM000002	3459	9308	9307	0	67	70	0			
SPM000003	3460	9309	9308	0	67	70	0			
SPM000005	3462	9312	9313	0	184	103	0			
SPM000006	3463	9313	9314	0	184	103	0			
SPM000009	3466	9318	9319	0	80	45	0			
SPM000011	3469	9309	9318	0	90	38	0			
SPM000012	3470	9312	9310	0	173	111	0			
SPM000014	4523	9313	8984	0	129	156	0			
SPM000015	4524	9314	8985	0	142	48	0			
SPM000018	5029	9310	9160	0	173	111	0			
SPM000019	5416	8984	9263	0	129	156	0			
SPM000020	5417	8985	9264	0	142	48	0			
SPM010001	4389	9175	9114	0	119	15	0			
SPM010005	4393	9181	9180	0	150	85	0			
SPM010006	4394	9182	9181	0	150	85	0			
SPM010007	4396	9185	9184	0	185	24	0			
SPM010008	4490	9186	9185	0	185	24	0			

Table 5-2 (Continued)
Sags, Grease, Deposits, and Obstacles

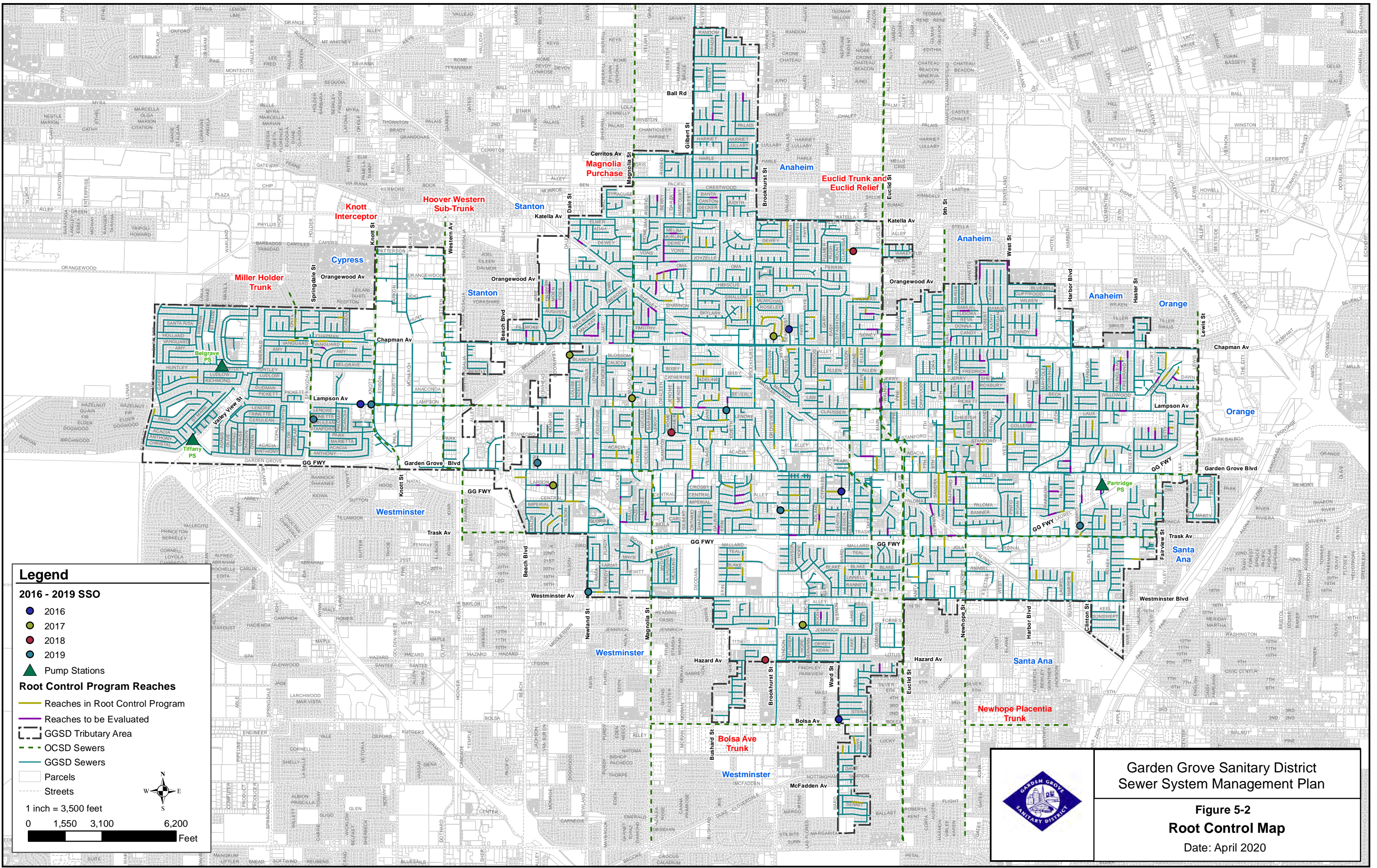
Previous Sewer ID	Sewer ID	US MH	DS MH	Sags No of Joints	Grease - No of Joints	Deposits No of Joints	Obstacles Highest Percentage	Hot Spot Duration	Existing Root Treatment Reach	Recommendation from 2011 Hot Spot Evaluation
SPM010009	4491	9186	9187	0	96	21	0			
SPM010015	4498	9194	9195	0	91	34	0			
SPM010016	4499	9195	9188	0	98	63	0			
SPM010018	4501	9198	9197	25	150	60	0			
SPM010019	4502	9199	9198	25	150	60	0			
SPM010020	4503	9201	9200	17	124	10	0			
SPM010021	4504	9195	9201	17	124	10	0			
SPM010022	4505	9200	9199	0	105	12	0			
SPM010023	3638	9200	9139	17	124	10	0			
SPM010025	3473	9328	9327	0	102	39	0			
SPM010026	3474	9329	9328	0	145	61	0			
SPM010027	3475	9330	9331	0	98	14	0			
SPM010028	3477	9330	9329	0	145	61	0			
SPM010029	3478	9332	9116	0	61	41	0			
SPM010030	3479	9331	9332	0	61	41	0			
SPM010032	3481	9330	9334	0	98	12	0			
SPM010033	3482	9336	9337	0	130	40	0			
SPM010034	3483	9335	9336	0	130	40	0			
SPM010035	3484	9337	9328	0	87	68	0			
SPM010036	5030	9327	9173	0	102	39	0			
SPM010038	5032	9336	9176	0	126	126	0			
SPM020006	4395	9183	9182	0	175	81	0			
SPM020008	4506	9202	9267	0	141	96	0			
SPM020009	4507	9202	9189	0	114	31	0			
SPM020011	4509	9204	9205	0	97	40	0			
SPM020012	4510	9205	9206	0	147	52	0			
SPM020013	4511	9206	9207	0	147	52	0			
SPM020014	4512	9205	9183	0	175	81	0			
SPM020015	4513	9204	9189	0	97	50	0			
SPM020024	3591	9223	9222	0	95	42	0			
SPM020025	3592	9219	9223	0	97	21	0			
SPM020029	3639	9267	9140	0	141	96	0			
SPM020031	3485	9344	9345	0	78	56	0			
SPM020032	3486	9345	9346	0	120	34	0			
SPM020033	3488	9344	9347	0	119	11	0			
SPM020035	3489	9349	9345	0	120	10	0			
SPM020036	3490	9346	9350	0	133	64	0			
SPM020038	3492	9352	9353	0	121	66	0			
SPM020045	5034	9207	9344	0	147	52	0			
SPM020046	5035	9210	9776	0	105	0	0			
SPM030007	4517	9212	9213	0	198	0	0			
SPM030008	4518	9213	9214	0	198	0	0			
SPM030009	4519	9214	9215	0	198	0	0			
SPM030013	3597	9227	9228	0	92	8	0			
SPM030014	3598	9228	9229	0	106	12	0			
SPM030015	3599	9229	8343	54	96	12	0			
SPM030031	3650	8936	8937	0	115	0	0			
SPM030033	3652	8938	8939	0	141	0	0			
SPM030035	3658	8946	8947	0	116	14	0			
SPM030040	3664	8952	8953	0	125	48	0			
SPM030042	5412	8343	8945	18	99	15	0			
SPM040029	3672	8962	8961	0	130	0	0			
SPM040030	3673	8963	8962	0	130	0	0			
SPM040031	3675	8965	8964	0	196	45	0			

Table 5-2 (Continued)
Sags, Grease, Deposits, and Obstacles

Previous Sewer ID	Sewer ID	US MH	DS MH	Sags No of Joints	Grease - No of Joints	Deposits No of Joints	Obstacles Highest Percentage	Hot Spot Duration	Existing Root Treatment Reach	Recommendation from 2011 Hot Spot Evaluation
SPM040039	4413	8974	8973	0	176	0	0			
SPM040040	4414	8965	8974	0	176	0	0			
SPM040042	4416	8349	8975	0	0	197	0			
SPM040043	4417	8975	8976	0	0	197	0			
SPM040044	4418	8976	8966	0	0	197	0			
SPM120024	2742	12034	12035	0	0	1	50			
SPM990001	4373	9156	9155	0	150	53	0			
SPM990002	4374	9157	9156	0	150	53	0			
SPM990004	4376	9159	9158	0	83	47	0			
SPM990006	4378	9162	9157	0	183	42	0			
SPM990007	4379	9164	9163	0	55	61	0			
SPM990008	4380	9165	9164	0	95	66	0			
SPM990012	4384	9164	9168	0	64	50	0			
SPM990017	3637	9163	9138	0	62	67	0			
SPM990021	3441	9292	9291	0	65	60	0			
SPM990022	3442	9292	9293	0	183	42	0			
SPM990024	3446	9295	9294	0	85	46	0			
SPM990026	3448	9298	9297	0	126	56	0			
SPM990027	3449	9299	9298	0	126	56	0			
SPM990030	3452	9296	9291	0	98	47	0			
SPM990032	3454	9293	9302	0	98	11	0			
SPM990033	5028	9291	9159	0	50	72	0			
SPN110006	2382	11145	11146	0	109	0	0			
SPN180007	144	7271	7558		100	0	0			
SPO100002	5119	11787	11768	0	3	105	0			
SPO120003	5395	11832	11834	0	0	150	0	Monthly Check Only		
SPO120010	5400	11838	13491	65	82	58	0			
SPO140041	2286	11192	11067	0	0	1	50			
SPP080004	6322	12999	13000	0	131	0	0			
SPP080018	6202	12951	12953	0	77	49	5			
SPP090002	6585	12563	12539	0	0	106	25			
SPP090023	6260	12921	12922	0	6	3	70			
SPP100001	6055	12539	12540	13	76	93	40			
SPP100002	6056	12540	12541	0	25	82	20			
SPP100005	6059	12543	12531	0	66	35	5			
SPP110039	4408	11764	11765	0	115	0	0			
SPP120004	5275	11410	11411	0	0	106	5			
SPP140014	4818	11914	11915	0	17	87	5			
SPQ060016	5984	13207	13194	0	57	74	5			
SPQ070036	5897	13148	13149	0	0	111	5			
SPQ080023	6438	12225	12991	0	76	27	5			
SPQ090051	6421	12824	12825	17	78	31	10			
SPQ090052	6453	12825	12826	0	48	59	40			
SPQ100027	6337	12803	12806	0	47	71	5			
SPQ100030	6340	12806	12809	0	42	64	5			
SPQ110012	4136	12515	12516	0	0	104	5			
SPQ110013	4137	12516	12519	0	0	113	5			
SPQ120044	6212	11706	11707	0	0	0	0		Root Treatment	
SPQ130017	3820	11461	11462	0	2	0	0		Root Treatment	
SPQ130018	3821	11462	11464	0	0	0	0		Root Treatment	
SPQ140026	3847	11439	10864	0	5	96	5			
SPQ140028	3849	11441	10867	0	59	42	0			

Table 5-2 (Continued)
Sags, Grease, Deposits, and Obstacles

Previous Sewer ID	Sewer ID	US MH	DS MH	Sags No of Joints	Grease - No of Joints	Deposits No of Joints	Obstacles Highest Percentage	Hot Spot Duration	Existing Root Treatment Reach	Recommendation from 2011 Hot Spot Evaluation
SPR090010	5961	12193	12194	0	31	16	50			
SPR100004	5776	11630	11631	0	2	100	10			
SPR100009	5638	12163	12147	0	81	43	5			
SPR100022	5672	12183	12184	0	0	37	65			
SPR110017	5753	12747	12168	0	68	75	5			
SPR110029	6082	11648	11674	0	57	53	5			
SPR110035	5691	11673	11674	0	7	3	90			
SPR110038	5738	11676	11677	0	0	112	45			
SPR120030	6161	11667	11637	0	72	53	5			
SPR130017	3862	11982	11981	0	1	1	50			
SPS110010				0	0	106	5			
SPS120040	7361	13801	13821	0	0	101	35			
SPT080008	6098	13009	13004	0	76	76	5			
SPT100023	5363	12646	12647	1	0	2	50			
SPT100040	3923	12662	12663	0	0	1	55			
SPT100048	6535	12842	12648	0	69	33	5			
SPT110021	3976	12400	12401	0	89	76	5			
SPT110039	4590	12467	12421	0	90	68	5			
SPE080030	1398	8888	8889		111	6	0			Not added to HS list
SPE080031	1399	8894	8893		165	24	0			Not added to HS list
SPE080043	1520	7864	7865		84	34	0			Not added to HS list
SPE080047	1530	7875	7874		0	114	0			Not added to HS list
SPE080049	1957	8917	7859		0	109	0			Not added to HS list
SPE090036	1454	7849	7850		110	4	0			Not added to HS list
SPJ090001	6999	13550	13549	41	15	9	50			Not added to HS list
SPK090001	7428	13863	13864	0	100	74	5			Not added to HS list
SPL060043	5331	10844	10845	0	121	0	0			Not added to HS list
SPQ060005	5972	13195	13197	0	96	93	5			Not added to HS list
SPQ060007	5974	13197	13198	0	80	74	5			Not added to HS list
SPQ060008	5975	13198	13199	0	81	61	5			Not added to HS list
SPQ090010	6076	12564	12573	0	89	20	5			Not added to HS list
SPQ090019	4746	12573	12574	10	100	70	5			Not added to HS list
SPQ110004	4128	12601	12510	0	108	10	5			Not added to HS list
SPQ120007	6543	12478	12479	0	94	16	40			Not added to HS list
SPR120019	5685	11655	11658	0	72	73	5			Not added to HS list
SPR120021	5686	11658	11636	0	58	57	5		Root Treatment	Not added to HS list
SPR120037	5747	14366	11652	0	86	89	5			Not added to HS list
SPT090019	6026	12250	12251	0	80	54	5			Not added to HS list
SPT090044	6142	12251	12252	0	98	74	5			Not added to HS list
SPS100023				90	1	102	5			Was Replaced CIP Proj.in 2009
SPS100024				93	106	0	0			Was Replaced CIP Proj.in 2009
SPS100029	5650	12694	12643	0	105	1	5			Was Replaced CIP Proj.in 2009
SPS130014	558	6737	6738	24	23	6	80			Will evaluate. No Access to D/S MH



Legend

2016 - 2019 SSO

- 2016
- 2017
- 2018
- 2019
- ▲ Pump Stations

Root Control Program Reaches

- Reaches in Root Control Program
- Reaches to be Evaluated

Boundaries and Infrastructure

- GGSD Tributary Area
- OCSD Sewers
- GGSD Sewers
- Parcels
- Streets

1 inch = 3,500 feet

0 1,550 3,100 6,200 Feet



Garden Grove Sanitary District
Sewer System Management Plan

Figure 5-2
Root Control Map
Date: April 2020

**Table 5-3
Root Control Program Reaches**

Previous Sewer ID	Sewer ID	US MN	DS MN	Length (ft)	No. Root Ball Main	No. Root Ball Lateral	Comment
SPT150006	433	7452	7453	327	0	1	Currently in Root Control Program
SPT110028	4093	12367	12420	130	2		Currently in Root Control Program
SPT110017	3972	12396	12397	198	1		Currently in Root Control Program
SPT090012	5265	12638	12639	105	0	1	Currently in Root Control Program
SPT090011	5264	12637	12639	130	0		Currently in Root Control Program
SPT090009	5262	12635	12624	395	1		Currently in Root Control Program
SPT090005	5258	12630	12631	200	0	1	Currently in Root Control Program
SPT090004	5257	12629	12630	245	0		Currently in Root Control Program
SPT090003	5256	12628	12629	200	0	1	Currently in Root Control Program
SPS160020	473	7496	7497	395	0	1	Currently in Root Control Program
SPS140043	602	6752	6753	172	2		Currently in Root Control Program
SPS140025	543	6725	6726	295	0		Currently in Root Control Program
SPS120001	4480	12428	12429	305	0		Currently in Root Control Program
SPS110014	5665	12098	12099	370	0		Currently in Root Control Program
SPS090008	6513	12734	12735	145	1		Currently in Root Control Program
SPR140004	6477	12768	12769	30	0		Currently in Root Control Program
SPR140003	6476	12767	12768	135	0		Currently in Root Control Program
SPR120021	5686	11658	11636	325	0	1	Currently in Root Control Program
SPR110034	6088	11656	11657	325	2		Currently in Root Control Program
SPR100047	5475	0	0	60	1		Currently in Root Control Program
SPR100038	6165	11684	11685	351	1		Currently in Root Control Program
SPR090014	5965	12197	12199	145	1		Currently in Root Control Program
SPQ150014	4312	11491	11492	415	0	1	Currently in Root Control Program
SPQ120045	6213	11707	11708	350	2		Currently in Root Control Program
SPQ120044	6212	11706	11707	350	4	2	Currently in Root Control Program
SPQ120043	6211	11705	11706	240	1	1	Currently in Root Control Program
SPQ120024	4118	12500	12501	90	0		Currently in Root Control Program
SPQ110015	4139	12518	12519	325	0		Currently in Root Control Program
SPP160017	5327	11959	11960	185	0		Currently in Root Control Program
SPP150028	5311	11940	11941	305	0	1	Currently in Root Control Program
SPP120013	5135	11017	11018	332	0	1	Currently in Root Control Program
SPP120005	5276	11411	11412	330	1		Currently in Root Control Program
SPP100031	4795	11775	11764	600	0	1	Currently in Root Control Program
SPP100030	4794	11774	11775	530	0	4	Currently in Root Control Program
SPO230010	17	7229	7230	406	0	1	Currently in Root Control Program
SPO210016	393	7304	7305	302	0	1	Currently in Root Control Program
SPO210010	124	6864	6865	329	0	4	Currently in Root Control Program
SPO160042	2176	10463	10464	270	0	1	Currently in Root Control Program
SPO140053	2529	11204	11205	305	0		Currently in Root Control Program
SPO140051	2295	11202	11203	332	0		Currently in Root Control Program

Table 5-3 (Continued)
Root Control Program Reaches

Previous Sewer ID	Sewer ID	US MN	DS MN	Length (ft)	No. Root Ball Main	No. Root Ball Lateral	Comment
SPO120017	3024	12263	11624	150	0	1	Currently in Root Control Program
SPO120015	5405	11843	11844	305	0		Currently in Root Control Program
SPO120014	6926	13496	11843	310	0		Currently in Root Control Program
SPO100022	2394	11217	11218	265	0	1	Currently in Root Control Program
SPO100009	4946	12353	12354	300	0	2	Currently in Root Control Program
SPO090016	5430	12346	12347	310	0	1	Currently in Root Control Program
SPO090013	5427	12343	12344	372	0	1	Currently in Root Control Program
SPO070018	4104	10639	10641	250	0	1	Currently in Root Control Program
SPO070007	5576	10629	10630	351	0		Currently in Root Control Program
SPO070006	5575	10628	10629	275	0		Currently in Root Control Program
SPO070005	5574	10627	10628	140	0		Currently in Root Control Program
SPO050026	5568	10618	9938	140	0		Currently in Root Control Program
SPN130022	2890	11071	11289	410	0	2	Currently in Root Control Program
SPN120028	2938	11079	11323	130	0	1	Currently in Root Control Program
SPN110031	2622	10687	10688	316	0	1	Currently in Root Control Program
SPN100050	3567	9476	9454	220	0		Currently in Root Control Program
SPN100049	3566	9475	9476	95	0		Currently in Root Control Program
SPN100048	3561	9470	9448	234	0		Currently in Root Control Program
SPN090054	3565	9474	9475	303	0		Currently in Root Control Program
SPN090030	3176	9441	9442	160	0		Currently in Root Control Program
SPN090029	3175	9440	9441	320	0	1	Currently in Root Control Program
SPN080048	4223	10189	9964	149	0		Currently in Root Control Program
SPN080041	5382	9977	9978	246	1	1	Currently in Root Control Program
SPN080037	5378	9973	9974	187	0	1	Currently in Root Control Program
SPN080036	5377	9972	9973	80	0	1	Currently in Root Control Program
SPN080011	5867	9913	9854	202	0	2	Currently in Root Control Program
SPN070021	6124	9882	9884	276	1	1	Currently in Root Control Program
SPN050048	4888	9944	9945	330	0	1	Currently in Root Control Program
SPN050018	4563	9696	9697	295	0	1	Currently in Root Control Program
SPM160009	2201	10553	10554	281	0	2	Currently in Root Control Program
SPM160003	2195	10548	10549	285	0	1	Currently in Root Control Program
SPM150013	2035	10543	10544	210	0	2	Currently in Root Control Program
SPM140020	2729	12020	12021	370	0	1	Currently in Root Control Program
SPM130014	2335	10763	10764	320	0	3	Currently in Root Control Program
SPM130005	2672	10754	10755	310	0	3	Currently in Root Control Program
SPM120004	2817	11332	11333	330	0	1	Currently in Root Control Program
SPM120003	2816	11331	11332	235	0	2	Currently in Root Control Program
SPM110055	3342	9488	9510	360	0	1	Currently in Root Control Program
SPM110049	2497	12046	12029	335	0	1	Currently in Root Control Program

Table 5-3 (Continued)
Root Control Program Reaches

Previous Sewer ID	Sewer ID	US MN	DS MN	Length (ft)	No. Root Ball Main	No. Root Ball Lateral	Comment
SPM110048	2496	12045	12046	135	0	1	Currently in Root Control Program
SPM110007	3254	9479	9480	330	0	1	Currently in Root Control Program
SPM100046	3283	9412	9526	80	0		Currently in Root Control Program
SPM100041	3277	9545	9547	310	0	2	Currently in Root Control Program
SPM100038	3274	9542	9543	285	0	1	Currently in Root Control Program
SPM100026	3230	9525	9526	280	0	1	Currently in Root Control Program
SPM100025	3229	9524	9525	300	0	2	Currently in Root Control Program
SPM100016	3582	9494	9495	355	0	1	Currently in Root Control Program
SPM100006	3197	0	0	50	0	1	Currently in Root Control Program
SPM090034	3292	9562	9563	280	0	1	Currently in Root Control Program
SPM090032	3290	9560	9561	322	0	2	Currently in Root Control Program
SPM080017	4651	9606	9607	250	0	1	Currently in Root Control Program
SPM080013	4647	9669	10273	130	0	1	Currently in Root Control Program
SPM070011	5045	9626	10275	255	0	1	Currently in Root Control Program
SPM070010	5044	9624	9625	304	0	1	Currently in Root Control Program
SPM050040	4086	10038	10039	329	0	2	Currently in Root Control Program
SPL130039	2957	11584	11592	218	0	1	Currently in Root Control Program
SPL120035	3163	9357	9358	303	0	1	Currently in Root Control Program
SPL120005	3116	8457	8458	323	0	1	Currently in Root Control Program
SPL120004	3115	8456	8457	333	0	4	Currently in Root Control Program
SPL120003	3114	8455	8456	333	0	1	Currently in Root Control Program
SPL110028	3312	9586	9587	340	0	1	Currently in Root Control Program
SPL110023	3308	9581	9582	160	0		Currently in Root Control Program
SPL110022	3307	9580	9581	130	0		Currently in Root Control Program
SPL110016	3301	9574	9575	250	0	1	Currently in Root Control Program
SPL110004	3227	9520	9521	270	0	2	Currently in Root Control Program
SPL100011	3319	9595	9566	334	0	1	Currently in Root Control Program
SPL070023	3721	10159	10160	300	2	1	Currently in Root Control Program
SPL060031	5226	10334	10333	287	0		Currently in Root Control Program
SPL060018	3731	10169	10170	282	2		Currently in Root Control Program
SPL050018	5073	10342	10343	145	0		Currently in Root Control Program
SPK160028	334	7004	6993	264	0	1	Currently in Root Control Program
SPK140033	763	7679	7684	330	0	2	Currently in Root Control Program
SPK140032	762	7678	7679	300	0	1	Currently in Root Control Program
SPK140005	2753	14201	11608	356	0	1	Currently in Root Control Program
SPK120013	3369	8395	8397	325	0		Currently in Root Control Program
SPK120004	3360	8386	8388	240	0		Currently in Root Control Program
SPK110013	3359	8385	8386	85	0		Currently in Root Control Program
SPK100014	3238	9091	9097	220	0		Currently in Root Control Program
SPJ140026	817	7080	7081	360	0		Currently in Root Control Program

Table 5-3 (Continued)
Root Control Program Reaches

Previous Sewer ID	Sewer ID	US MN	DS MN	Length (ft)	No. Root Ball Main	No. Root Ball Lateral	Comment
SPJ140014	805	7065	7066	295	0	1	Currently in Root Control Program
SPJ140012	803	7063	7064	135	0	1	Currently in Root Control Program
SPJ130029	751	7111	7105	50	0		Currently in Root Control Program
SPJ130028	846	7110	7111	310	0	1	Currently in Root Control Program
SPJ130027	6835	0	7110	315	0	1	Currently in Root Control Program
SPJ080024	2063	8714	8565	120	1		Currently in Root Control Program
SPJ070020	2080	8581	8582	300	1		Currently in Root Control Program
SPJ070016	2076	8577	8578	325	1	1	Currently in Root Control Program
SPG090054	1174	7352	7353	350	0		Currently in Root Control Program
SPG090018	1066	8278	8279	350	0		Currently in Root Control Program
SPG080041	1311	8227	8306	253	0	1	Currently in Root Control Program
SPF090013	1290	8735	8736	314	0	1	Currently in Root Control Program
SPF080016	1190	7371	7372	332	0	1	Currently in Root Control Program
SPE100041	1422	7833	7799	347	0	3	Currently in Root Control Program
SPD110015	1574	7937	8667	260	0	1	Currently in Root Control Program
SPL120021	3147	8486	8487	345	1		Added to the Program in 2016
SPN180030	190	6894	6895	350	1		Added to the Program in 2016
SPR160017	564	7535	7536	400	2		Added to the Program in 2016
SPM080045	9184	15243	10276	278	2		Added to the Program in 2016
SPP130024	4965	10876	11899	646	1		Added to the Program in 2017
SPP130025	4966	11899	11900	650	1		Added to the Program in 2017
SPO130041	2840	11166	11170	640	1		Added to the Program in 2017
SPP120015	5137	11020	11021	331	1		Added to the Program in 2017
SPQ130016	3819	11460	11461	120	1		Added to the Program in 2017
SPQ130017	3820	11461	11462	555	2		Added to the Program in 2017
SPQ130018	3821	11462	11464	570	2		Added to the Program in 2017
SPN080040	5381	9976	9977	283	2		Added to the Program in 2018
SPN080030	5371	9966	9967	290	2		Added to the Program in 2018
SPN080031	5372	9967	9968	320	2		Added to the Program in 2018
SPN080034	5375	9970	9971	345	2		Added to the Program in 2018
SPN080035	5376	9971	9973	230	2		Added to the Program in 2018
SPN080038	5379	9974	9981	155	2		Added to the Program in 2018
SPN080001	4143	9909	9848	202	1		Added to the Program in 2019
SPR130009	17163	12775	12776	399	1		Added to the Program in 2019
SPN140038	3085	10716	11316	355	1		Added to the Program in 2019
SPG090037	1476	7335	7336	213	0	1	Evaluate Addition to Root Control Program
SPJ070011	2071	8572	8573	325	0	1	Evaluate Addition to Root Control Program
SPJ070014	2074	8575	8576	325	0	1	Evaluate Addition to Root Control Program
SPJ070019	2079	8580	8581	300	0	3	Evaluate Addition to Root Control Program
SPJ080033	2422	8597	8598	250	0	1	Evaluate Addition to Root Control Program

Table 5-3 (Continued)
Root Control Program Reaches

Previous Sewer ID	Sewer ID	US MN	DS MN	Length (ft)	No. Root Ball Main	No. Root Ball Lateral	Comment
SPJ130012	791	7051	7052	200	0	1	Evaluate Addition to Root Control Program
SPJ130015	794	7054	7055	60	0	1	Evaluate Addition to Root Control Program
SPJ130016	795	7055	7056	60	0	1	Evaluate Addition to Root Control Program
SPK050039	1904	8052	8054	250	0	1	Evaluate Addition to Root Control Program
SPK070030	1901	8047	8513	358	0	1	Evaluate Addition to Root Control Program
SPK080028	1860	8003	8004	266	0	1	Evaluate Addition to Root Control Program
SPK080031	1906	8055	8058	300	0	1	Evaluate Addition to Root Control Program
SPK080052	2409	8005	8055	285	0	1	Evaluate Addition to Root Control Program
SPK090002	5928	10316	10317	150	0	1	Evaluate Addition to Root Control Program
SPK120024	3391	8413	8414	130	0	1	Evaluate Addition to Root Control Program
SPK130016	2750	11604	11605	60	0	1	Evaluate Addition to Root Control Program
SPK140023	2800	11578	11609	267	0	1	Evaluate Addition to Root Control Program
SPL040011	4924	8334	8335	307	0	1	Evaluate Addition to Root Control Program
SPL040012	5018	8335	8336	307	0	1	Evaluate Addition to Root Control Program
SPL040019	5518	9641	9642	254	0	1	Evaluate Addition to Root Control Program
SPL050014	5069	9742	9743	265	0	1	Evaluate Addition to Root Control Program
SPL050041	5176	10117	10121	250	0	1	Evaluate Addition to Root Control Program
SPL060009	5180	10121	10174	319	0	1	Evaluate Addition to Root Control Program
SPL060015	3728	10166	10168	279	0	1	Evaluate Addition to Root Control Program
SPL060017	3730	10168	10170	288	0	1	Evaluate Addition to Root Control Program
SPL060022	3735	10174	10178	335	0	1	Evaluate Addition to Root Control Program
SPL060024	3737	10176	10177	271	0	1	Evaluate Addition to Root Control Program
SPL060044	5946	10170	10334	289	0	1	Evaluate Addition to Root Control Program
SPL070026	4734	10813	10792	272	0	1	Evaluate Addition to Root Control Program
SPL070034	4840	10824	10825	270	0	2	Evaluate Addition to Root Control Program
SPL070035	4841	10825	10826	300	0	1	Evaluate Addition to Root Control Program
SPL080008	5182	10128	10129	190	0	1	Evaluate Addition to Root Control Program
SPL080024	4339	10796	10798	300	0	1	Evaluate Addition to Root Control Program
SPL080031	4721	10803	10806	258	0	1	Evaluate Addition to Root Control Program
SPL080036	4735	10814	10795	338	0	1	Evaluate Addition to Root Control Program
SPL110005	4242	9565	9566	310	0	1	Evaluate Addition to Root Control Program
SPL140025	3099	11564	11565	313	0	1	Evaluate Addition to Root Control Program
SPM010012	4495	9191	9192	310	0	1	Evaluate Addition to Root Control Program
SPM010035	3484	9337	9328	270	0	1	Evaluate Addition to Root Control Program
SPM030029	3642	9148	9272	180	0	1	Evaluate Addition to Root Control Program
SPM040035	3679	8969	8970	285	0	1	Evaluate Addition to Root Control Program
SPM100021	3425	9499	9500	215	0	1	Evaluate Addition to Root Control Program
SPM110031	3260	9506	9507	310	0	2	Evaluate Addition to Root Control Program
SPM130016	2337	10765	10766	340	0	1	Evaluate Addition to Root Control Program
SPM130035	2748	12040	12053	315	0	1	Evaluate Addition to Root Control Program

Table 5-3 (Continued)
Root Control Program Reaches

Previous Sewer ID	Sewer ID	US MN	DS MN	Length (ft)	No. Root Ball Main	No. Root Ball Lateral	Comment
SPM140002	2340	10769	10770	320	0	1	Evaluate Addition to Root Control Program
SPM140029	8279	14510	14509	345	0	1	Evaluate Addition to Root Control Program
SPN150007	2192	10478	10479	325	0	1	Evaluate Addition to Root Control Program
SPO080008	4105	10640	10641	346	0	1	Evaluate Addition to Root Control Program
SPO080017	4114	10649	10650	420	0	1	Evaluate Addition to Root Control Program
SPO100001	5118	11786	11787	535	0	3	Evaluate Addition to Root Control Program
SPO100002	5119	11787	11768	535	0	1	Evaluate Addition to Root Control Program
SPO120010	5400	11838	13491	355	0	2	Evaluate Addition to Root Control Program
SPO140052	2528	11203	11204	316	1	1	Evaluate Addition to Root Control Program
SPO170043	252	6966	6967	275	0	2	Evaluate Addition to Root Control Program
SPP080026	6245	12962	12963	346	0	1	Evaluate Addition to Root Control Program
SPP100036	4643	11780	11782	285	0	1	Evaluate Addition to Root Control Program
SPP140004	4968	11901	11903	400	0	1	Evaluate Addition to Root Control Program
SPP140007	5358	11905	11906	370	0	4	Evaluate Addition to Root Control Program
SPP140033	4910	11812	11813	300	0	1	Evaluate Addition to Root Control Program
SPP190007	64	6799	6800	356	0	1	Evaluate Addition to Root Control Program
SPQ060001	5765	13109	13110	330	0	1	Evaluate Addition to Root Control Program
SPQ060007	5974	13197	13198	310	0	1	Evaluate Addition to Root Control Program
SPQ060008	5975	13198	13199	305	0	1	Evaluate Addition to Root Control Program
SPQ070006	6324	13001	12206	370	0	1	Evaluate Addition to Root Control Program
SPQ080022	6437	12224	12225	150	0	1	Evaluate Addition to Root Control Program
SPQ090052	6453	12825	12826	385	0	1	Evaluate Addition to Root Control Program
SPQ090053	6454	12827	12830	220	0	1	Evaluate Addition to Root Control Program
SPQ090055	6456	12829	12830	245	0	1	Evaluate Addition to Root Control Program
SPQ100002	5582	12605	12606	320	0	2	Evaluate Addition to Root Control Program
SPQ100022	6163	11680	11681	298	0	1	Evaluate Addition to Root Control Program
SPQ120001	5480	12468	11706	106	0	1	Evaluate Addition to Root Control Program
SPQ130011	3814	11455	11463	290	0	1	Evaluate Addition to Root Control Program
SPQ130013	3816	11457	11458	340	0	1	Evaluate Addition to Root Control Program
SPQ150004	5354	11468	11469	320	0	1	Evaluate Addition to Root Control Program
SPR080006	6563	13035	13036	265	0	1	Evaluate Addition to Root Control Program
SPR100023	5673	12184	14370	340	0	1	Evaluate Addition to Root Control Program
SPR110020	6042	11640	11642	265	0	1	Evaluate Addition to Root Control Program
SPR120012	4585	12464	13750	310	0	2	Evaluate Addition to Root Control Program
SPR130009	6515	12775	12776	400	0	2	Evaluate Addition to Root Control Program
SPR140006	6479	12770	12771	310	0	1	Evaluate Addition to Root Control Program
SPR160022	571	7548	7549	71	0	1	Evaluate Addition to Root Control Program
SPS090004	6508	12729	12730	269	0	1	Evaluate Addition to Root Control Program
SPS090011	6547	12735	12736	388	0	2	Evaluate Addition to Root Control Program
SPS090014	5646	12739	12740	235	0	2	Evaluate Addition to Root Control Program

**Table 5-3 (Continued)
Root Control Program Reaches**

Previous Sewer ID	Sewer ID	US MN	DS MN	Length (ft)	No. Root Ball Main	No. Root Ball Lateral	Comment
SPS100001	6378	15086	15085	288	0	1	Evaluate Addition to Root Control Program
SPS100027	6549	12737	12710	390	0	1	Evaluate Addition to Root Control Program
SPS120033	7319	13768	13769	316	0	2	Evaluate Addition to Root Control Program
SPS130005	8375	6695	14605	313	0	1	Evaluate Addition to Root Control Program
SPS130015	559	6738	6739	316	0	3	Evaluate Addition to Root Control Program
SPT090001	5242	12612	12613	225	0	1	Evaluate Addition to Root Control Program
SPT090033	4034	12678	12659	150	0	1	Evaluate Addition to Root Control Program
SPT110018	3973	12397	12399	155	0	1	Evaluate Addition to Root Control Program
SPT110029	4094	12420	12421	350	0	1	Evaluate Addition to Root Control Program
SPT110031	4471	12368	12422	130	0	1	Evaluate Addition to Root Control Program

Pump Station Maintenance

The District owns and maintains three (3) sewer pump stations: Tiffany Pump Station, Belgrave Pump Station, and Partridge Pump Station. The District eliminated the Harbor- Edinger Pump Station by diverting the flow by gravity to the Orange County Sanitation District’s Newhope-Placentia Trunk Sewer on Harbor Boulevard and Heil Avenue. The tributary sewers were annexed to the City of Fountain Valley, who now maintains the service in this area.

Pump station descriptions are included in Appendix D-2 of this report.

The District maintains its pump stations on a daily, monthly, and semiannual frequency. The District keeps maintenance logs for each pump station that include the following items:

Daily Maintenance (Belgrave, Tiffany, and Partridge)

- Atmosphere quality
- Chart review/ Change recorder
- Miltronics check
- Vault check
- Wet well check
- Pump run checks
- Sump pump check
- Amps check
- Dialer check
- Pump alternating check
- Dry well check
- Noise check
- Security and cleanliness
- Control system auto check

Bi-Weekly Generator Maintenance (Belgrave and Tiffany)

- Load Hours
- Operate 50-70% Load (30 minutes)
- Drain water from fuel filter
- Non-Load Hours
- Check engine oil and coolant
- Air cleaner dust valve restriction indicator check

- Visual walk around
- Check fuses
- Replace alternator belt
- Check electrical and wiring

Monthly Generator Maintenance (Partridge)

- Load Hours
- Fuel Used
- Elapsed Time Operated
- Fuel Delivered

Monthly Maintenance (Belgrave, Tiffany, and Partridge)

- Add Degreaser
- Check float (Quarterly)
- Clean blower filter
- Operate gate valves (Semi-annually)

The procedure for pump station inspections should be reviewed:

- After a sanitary sewer overflow event at a pump station
- If increased operational and maintenance activity is observed during the current inspection frequency
- Annually, at minimum

Corrective Maintenance

The District is prepared to provide immediate corrective maintenance during an emergency situation. When there is a failure of a critical asset, the District prioritizes the workforce for its corrective maintenance. The corrective maintenance repairs include, but are not limited to, the following:

- Emergency cleaning to eliminate a pipe blockage
- Spot repair or replacement of a failed pipe
- Replacing a rattling or failed manhole cover
- Repairing or replacing a pump that has become clogged or damaged by debris
- Respond to, investigate and mitigate customer complaints
- Repair of earthquake damage
- Vandalism

C. REHABILITATION AND REPLACEMENT PLAN

Order 2006-0003-DWQ requires that the District must “develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan.”

Closed Circuit Television Inspections

The CCTV inspections are continuously conducted for the District's Sewer System Rehabilitation Plan (SSRP), and the inspection data reviewed to assess the conditions of the sewers. The District established a program to CCTV inspect its entire gravity sewer system, consisting of 1,669,714 feet (316 miles, 6,793 reaches) of pipe ranging between 6-inch and 24-inch in diameter.

The District owns and operate a CCTV van with video recording equipment, and currently performs the closed circuit television (CCTV) inspections of its collection sewers and manholes, in house. Inspections are currently documented on hard drives, and the condition assessment is performed by contract services.

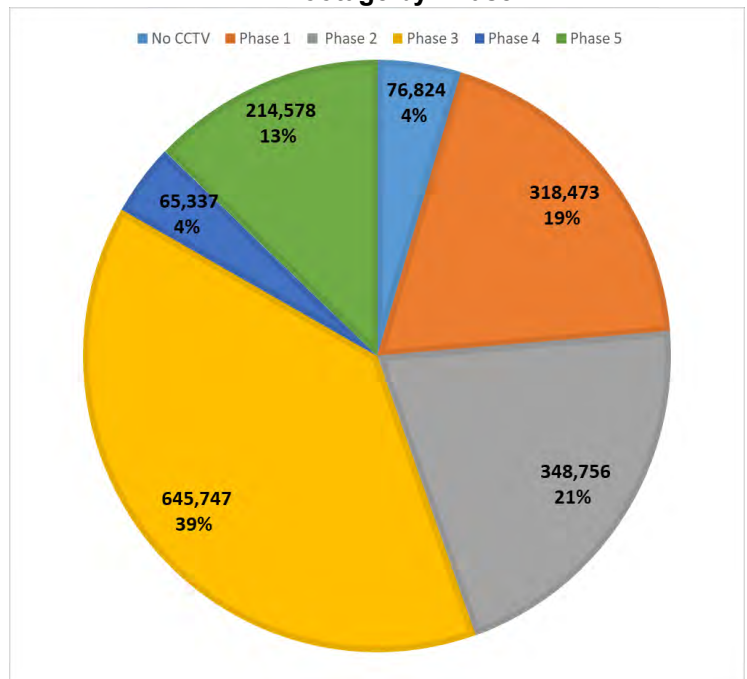
The CCTV inspections and condition assessment of the District's entire sewer system were performed in five phases by the District staff, Performance Pipeline Technologies, and Empire Pipe. The inspection took place between November 2003 and October 2012. A summary of the CCTV inspection by phase is illustrated on Figure 5-3 and Figure 5-4. A summary of the CCTV inspections is included in Appendix D-3.

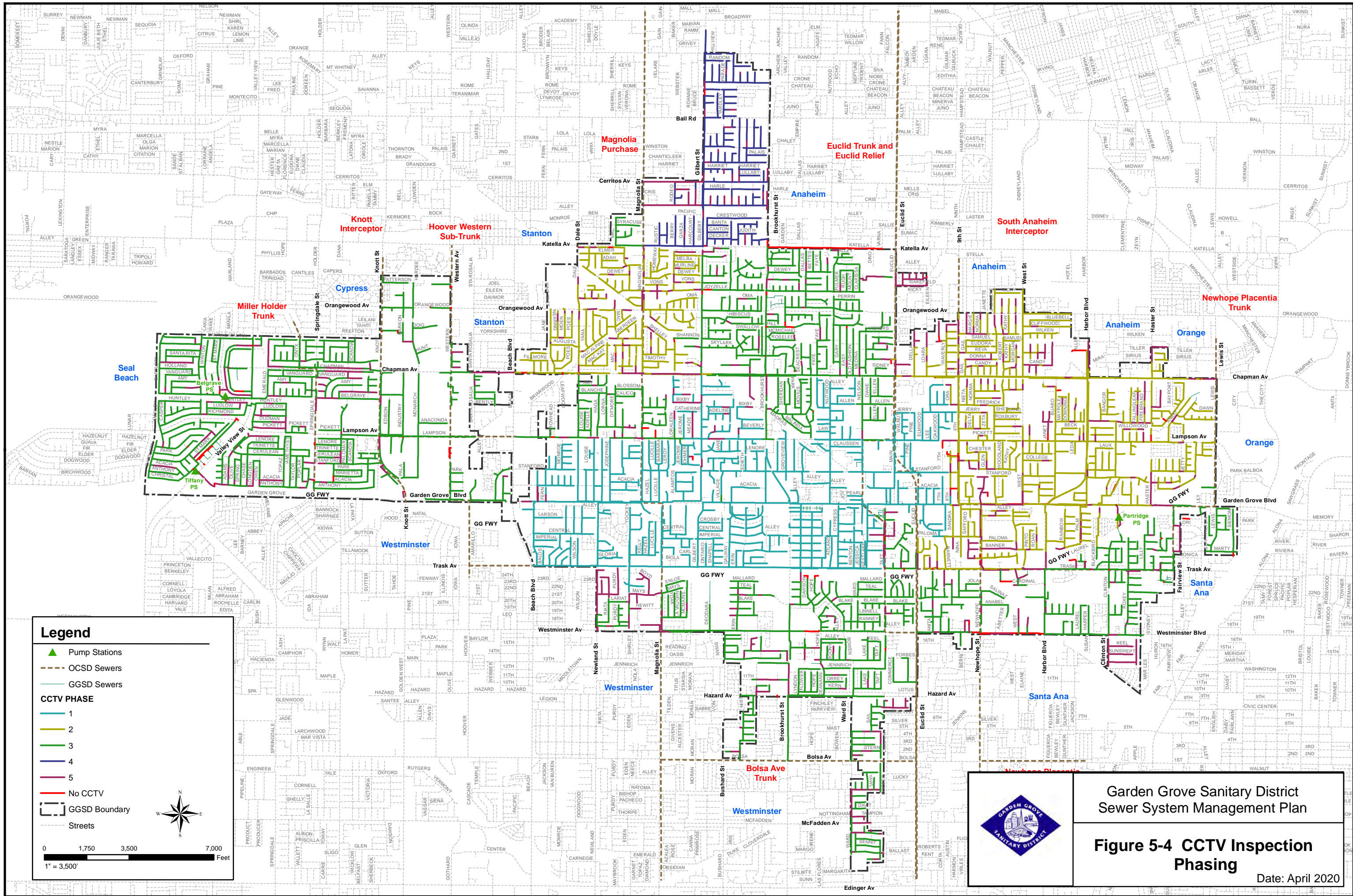
Phase 1 of this program was completed in 2004 generally in the central area of the service area. Condition of the CCTV inspected system was evaluated through review of all the written reports developed by the CCTV contractor, and viewing of recordings for 297 reaches of pipe (25 percent of the inspected sewers). Condition assessment of the inspections performed in Phase 1 was documented in the District's Sewer System Rehabilitation Plan (dated September 2005).

Phase 2 of this program was completed in 2006, generally in the northeast and north central area of the service area. Condition of the CCTV inspected system was evaluated through review of all the written reports developed by the CCTV contractor, and viewing for 548 reaches (37 percent of the inspected sewers). Condition assessment of the inspections performed in Phase 2 was documented in the District's Sewer System Rehabilitation Plan, Phase 2 (dated June 2006).

Phase 3 of the CCTV inspection and condition assessment program includes inspections covering the west area, the south area, and the north central area of the service area. Condition of the CCTV inspected system was evaluated through review of all the written reports developed by the CCTV contractor, and viewing for 332 reaches (13 percent of the inspected sewers). Condition assessment of the inspections performed in Phase 3 was documented in the District's Sewer System Rehabilitation Plan, Phase 3 (dated May 2008).

**Figure 5-3
CCTV Footage by Phase**





Garden Grove Sanitary District
Sewer System Management Plan

Figure 5-4 CCTV Inspection Phasing

Date: April 2020

Phase 4 of the CCTV inspection was completed in 2008 to evaluate the condition of the District's sewers that are located within the unincorporated Orange County areas, generally north of Katella Avenue, between Magnolia Street and Brookhurst Street.

Phase 5 of the CCTV inspection was completed in 2012 with the intent to complete the condition assessment of the District's gravity sewers and to reevaluate the sewers that were identified to have condition deficiencies from the previous four (4) phases.

As identified on Figure 5-3 and Figure 5-4, the District has not CCTV inspected approximately 4% of its system. Reasons for no condition assessment include, but are not limited to the following:

- Replacement sewers were constructed to address capacity or condition deficiencies addressed in the District's Capital Improvement Program. These reaches should be CCTV inspected and added to the next phase of the District's comprehensive condition assessment program.
- There are access issues, which make inspecting the reach unfeasible. Some reaches could not be inspected due to heavy calcium.
- The GIS sewer shapefile should be updated to account for all abandoned pipes, which do not require CCTV inspection.

Inspection Report Database Summary

Initially, an Inspection Report Database Summary was developed utilizing the CCTV inspection written reports. Over the years, there have been updates to the District's sewer naming system, as well as updates to the Inspection Report Database Summary. The attributes from the tables for each phase was compiled into one comprehensive database. This Database Summary contained a tabulation of the deficiencies identified in the written reports, including but not limited to the following information:

- DVD Number/ Tape No.
- Inspection (Run) Number
- Reversal DVD Number
- Reversal Inspection (Run) Number
- Location (Street Name)
- CCTV Date
- Sewer Identification Number (Existing and Previous)
- Upstream Manhole and Downstream Identification Numbers (Existing and Previous)
- Direction of Camera
- Pipe Size and Material
- GIS Length and CCTV Inspected Length of Pipe
- Deficiency Tabulation from Written Reports using PACP codes

The Inspection Report Database Summary was used in selecting the recordings to be reviewed in detail. The pipe reaches selected for detailed review were those that showed the most severe structural problems and multiple deficiencies, as well as severe operation and maintenance issues.

The pipe condition assessment was incorporated into the original Inspection Report Database Summary. This combined summary, (Appendix D-3) includes a total of 6,352 reaches (1,597,525 feet GIS length). 102 reverse inspections were conducted and are included in the combined summary.

Rehabilitation/Replacement Priorities

The PACP condition grading system was used to assign a condition rating for structural defects and operation and maintenance defects for each reach of pipe. The rating provides the ability to quantitatively measure the difference in pipe condition between one inspection and subsequent inspections, and to prioritize among different pipe segments. A grade of 1 to 5 is assigned to each defect based on potential for further deterioration or pipe failure. Pipe failure is defined as when it can no longer convey the design capacity. The grades are as follows:

5 – Immediate	Attention Defects requiring immediate attention
4 – Poor	Severe defects that will become Grade 5 defects within the foreseeable future
3 – Fair	Moderate defects that will continue to deteriorate
2 – Good	Defects that have not begun to deteriorate
1 – Excellent	Minor defects

The grade values for the most common defects are shown in Table 5-4. For defects with variable grade values dependent on the degree of deficiency of the defect, an estimated average value was used.

Figure 5-5 shows the number of reaches where an identified deficiency was found at least once within the reach. It provides a general sense of the magnitude of the problems that were found in the portion of the District's collection system that was CCTV inspected. The problems identified most were cracks (2,091 reaches, 30% of Total), fine roots (1,291 reaches, 18% of total), and fractures (1,115 reaches, 15% of total).

The purpose of CCTV inspections is to determine the condition of the GGSD existing gravity sewers, and formulate a rehabilitation plan for the defective sewers. The rankings provide a good indication as to which pipes are in poor condition, but cannot be relied upon solely to prioritize improvement projects. The priorities are selected primarily with consideration of the health and safety of the public and protection of the environment by minimizing the possibility of sanitary sewer overflows and leakage. The pipe capacity, location of particular defects, and the tributary areas/wastewater flow rates are other considerations used in formulating the final capital improvement project priorities.

The initial priorities for improvements to the sewers are based on the severity of the pipe defects. The seven (7) categories utilized in this report are as follows:

- a. Severe Condition – This category primarily includes structural defects of deformed pipe, hole in pipe, broken pipe, and large joint offsets.
- b. Major Condition – This category primarily includes structural defects of multiple fractures, medium joint offsets and major sags. Pipes with a large number of cracks are also included.
- c. Moderate Condition – Pipes in this category have fractures, cracks, small and medium joint offsets, and sags.
- d. Minor Condition – Pipes in this category have slight sags, cracks, and small joint offsets.

**Table 5-4
Defect Codes and Condition Grades**

Structural Defects	Grade
Crack - circumferential	CC 1
Crack - longitudinal	CL 2
Crack - multiple	CM 3
Crack - spiral	CS 2
Crack - Hinge	CH 4
Fracture - circumferential	FC 2
Fracture - longitudinal	FL 3
Fracture - multiple	FM 4
Fracture - spiral	FS 3
Fracture - Hinge	FH 4
Broken - soil visible	BSV 5
Broken - void visible	BVV 5
Hole - soil visible	HSV 5
Hole - void visible	HVV 5
Deformed - horizontal	DH 5
Deformed - vertical	DV 5
Collapsed	XP 5
Joint Offset - medium	JOM 3 ^a
Joint Offset - large	JOL 5 ^b
Joint Separated - small	JSS 1 ^c
Joint Separated - medium	JSM 1
Joint Separated - large	JSL 2
Surface Damage	S 2
Lining Failure	LF 3
Point Repair - defective	RPPD 4
Sags	MWLS 2

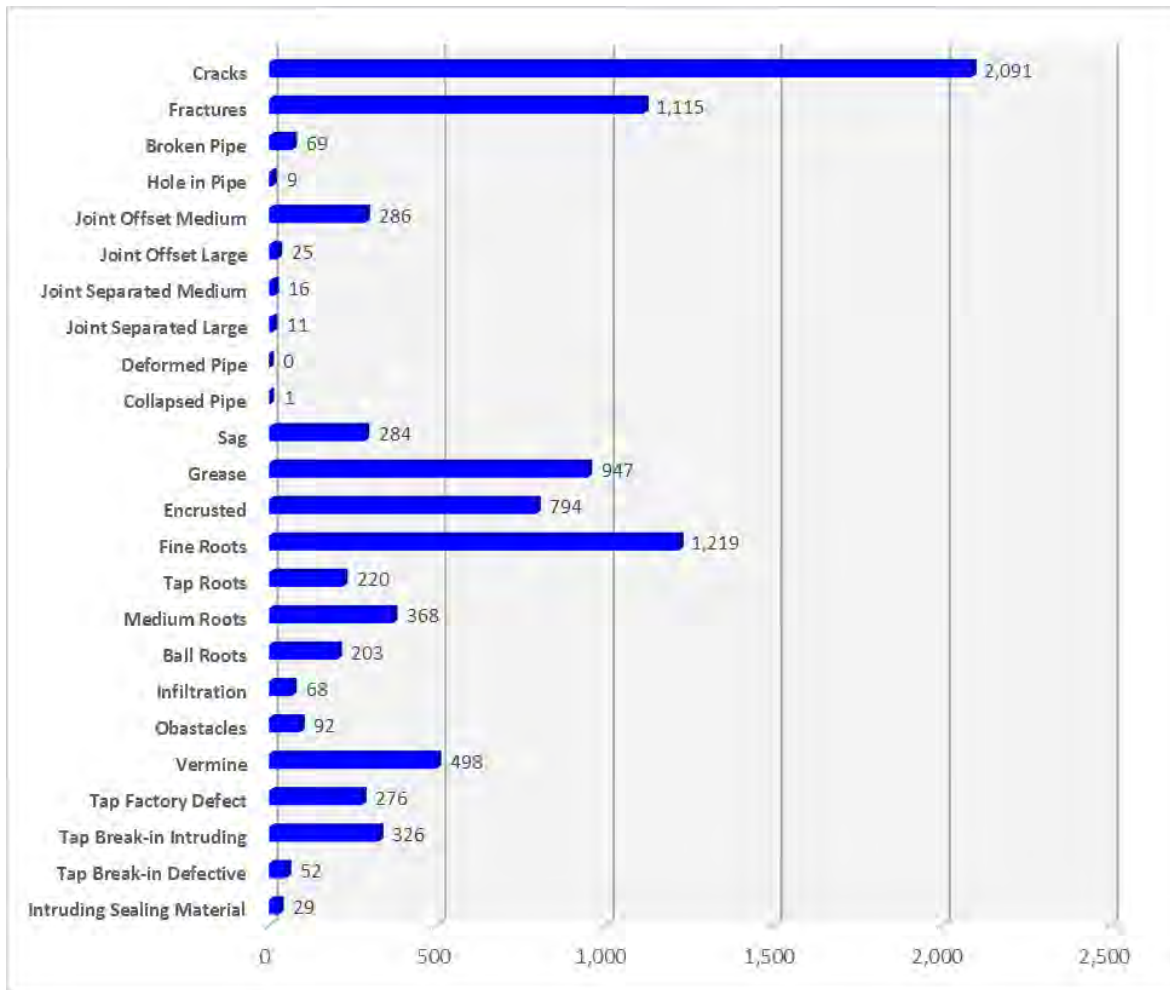
Operational & Maintenance /Construction Feature Defects	Grade
Deposits Attached - encrustation barrel	DAE 2
Deposits Attached - grease	DAGS 2
Deposits Attached - other	DAZ 3
Deposits Settled	DS 2
Deposits Ingress	DN 2
Roots Fine - barrel	RFB 2
Roots Fine - lateral	RFL 1
Roots Fine - joint	RFJ 1
Roots Fine - connection	RFC 1
Roots Tap - barrel	RTB 3
Roots Tap - lateral	RTL 2
Roots Tap - joint	RTJ 2
Roots Tap - connection	RTC 2
Roots Medium - barrel	RMB 4
Roots Medium - lateral	RML 3
Roots Medium - joint	RMJ 3
Roots Medium - connection	RMC 3
Roots Ball - barrel	RBB 5
Roots Ball - lateral	RBL 4
Roots Ball - joint	RBJ 4
Roots Ball - connection	RBC 4
Infiltration - weeper	IW 2
Infiltration - dripper	ID 3
Infiltration - runner	IR 4
Infiltration - gusher	IG 5
Obstacles	OB 4
Vermin	V 1
Tap (Lateral) factory made - defective	TFD 2
Tap (Lateral) break in - intruding	TBI 3
Tap (Lateral) break in - defective	TBD 3
Line	L 2
Intruding Sealing Material - ring hanging	ISSRH 4
Intruding Sealing Material - ring	ISSR 4
Miscellaneous - camera underwater	MCU 4
Miscellaneous - camera blocked	MSA 0

^aPACP grade is 1. Grade is increased for this report.

^bPACP grade is 2. Grade is increased for this report.

^cPACP does not have coding for small separated joints. This coding is developed for this report

**Figure 5-5
Sewer Reaches with Identified Deficiencies**

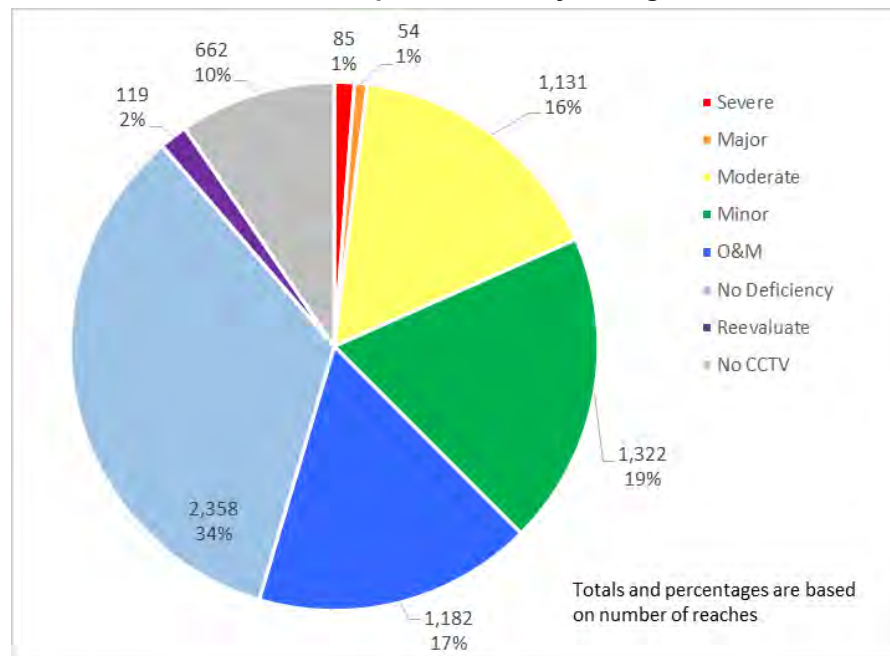


- e. O&M – This condition is for operational and maintenance problems and construction feature defects. There are no structural defects.
- f. No Deficiency – This condition is for the pipe with no structural, operation and maintenance or construction feature defects.
- g. Reevaluate – This condition is for the pipes that have been rehabilitated since the initial condition assessment. CCTV inspection will be performed and a new condition assessment will be conducted to provide these reaches an appropriate categorization.

Appendix D-3 lists the CCTV locations by initial replacement/rehabilitation priorities, from most to least severe, based on the structural condition of the pipes. Pipes that have been repaired since the CCTV inspection have been updated with the repair date and description. Pipes that have been abandoned since its inspection are included for record keeping purposes. Appendix D-4 shows the CCTV locations color coded by rehabilitation/replacement priority.

Figure 5-6 illustrates the distribution of the comprehensive sewer priorities for the District's gravity sewer system.

**Figure 5-6
CCTV Inspection Priority Ratings**



Rehabilitation and Replacement Capital Improvement Program

The Garden Grove Sanitary District will address the “Severe” and “Major” collection system deficiencies. Table 5-5 lists the project priorities assigned to the 139-reaches of collection system identified as in “Severe” or “Major” condition, as well as planning level implementation costs based upon average 2019 dollars (Engineering News Record Index of 12,034.19 for the Los Angeles area). Implementation cost is determined by adding 35 percent of construction cost to cover engineering, inspection, and administration. The total estimated cost of upgrading the “Severe” or “Major” condition priorities is \$21.3M.

The District generally addresses the rehabilitation projects by the priorities included in Table 5-5.

The District has been proactive in implementing rehabilitation projects, by rehabilitating the reaches identified as “severe”, “major”, and “moderate”. The District generally provides improvements at sewers that can be completed by its staff. The sewers listed on the SSRP improvement list are marked as completed and highlighted, once the District has performed the rehabilitation, which generally consists of spot repairs. These pipes will be recommended to be included in the District’s subsequent Condition Assessment and Rehabilitation/Replacement Plan.

**Table 5-5
Structural Replacement/Rehabilitation**

Phase	Tape No.	DVD No.	Inspection No.	Reversal Tape No.	Reversal DVD No.	Reversal Inspec. No.	Location Street Name	CCTV Date	Pipe		Direction of Camera	Size (in)	Material	Length (ft)	CCTV Length (ft)	Priority	Ranking	Comments	Construct Costs (\$)	Total Cost (Const, Engin, Inspection, & Admin) (\$)	Completed
									Existing Sewer ID	Previous Sewer ID.											
2		R030	12				8TH ST	9/21/2005	5269	SFP110017	U/S	6	VCP	120	18.7	1_Severe	1	18.7' BROKEN PIPE (SV). 18.7' MSA = BROKEN PIPE. SOIL & ROOTS IN BROKEN PIPE. POSSIBLY ABANDONED	\$35,483	\$47,902	
3		53	22				LEWIS	1/10/2008	369	SFU130017	U/S	8	VCP	271	272	1_Severe	1	Repeat inspection, DVD 19 - Section 6 Spot repair at 120.40 ft BSV, 162.0 ft JOM	\$106,698	\$144,042	
5		MAP 3-B3-3	30				TAFT STREET	8/21/2012	4333	SPO140030	U/S	6	VCP	350	46.4	1_Severe	1	46.4' MSA (JOM). 46.4' BVV & after BVV Possible Collapsed Pipe (Pipe plugged with broken pipe materials). Severe Defect. No Reversal Video Replace Pipe 46.4' to end of the Collapsed Pipe	\$103,492	\$139,714	
1	21		12				10760 Garden Grove Blvd.	3/15/2004		SPO130006	DS	6	VCP	63	63	1_Severe	2	Replace pipe	\$18,628	\$25,148	
2		G003	3				WASCO DR	7/14/2005	1887	SPK060027	U/S	8	VCP	160	174.8	1_Severe	2	152.5' JOL (D/SH) JOL	\$63,081	\$85,159	
3		28	33				EASY	7/27/2007	5209	SPO800043	D/S	8	VCP	325	314	1_Severe	2	Replace from 260 ft to 314 ft	\$127,951	\$172,734	
5		MAP 3-3	3				EUCLED STREET	7/27/2012	5119	SPO100002	D/S	8	VCP	535	537.9	1_Severe	2	336.4' & 506' BSV, 508.1' BVV, 510.9' JOL (D/SL), 160' to 166' Deformed Pipe Horizontal. Too many Cracks & Fractures. 0' to 234' & 340' to 420' DSZ. Severe Defect Replace All Pipe or Replace Pipe 160 to 166' & 506' to 510.9', Patch Repair @ 336.4'. Reline Pipe	\$210,926	\$284,749	
1	45		11				10242 Garden Grove Blvd.	4/30/2004		SPN130004	DS	8	VCP	381	381	1_Severe	3	Replace pipe	\$150,211	\$202,784	
2		G058	7		G058	8	VOLKWOOD ST	12/13/2005		SPS110006	D/S	8	VCP	92	91.5	1_Severe	3	3' & 26.5' MSA =DAGS, HEAVY GREASE AT 26.5', NO INSPECTION 3' TO 26.5'	\$36,074	\$48,700	
5		MAP 1-2	7				LAMPLIGHTER STREET	7/19/2012	1126	SPG100014	D/S	8	Clay Tile	177	173.4	1_Severe	3	173.4' MSA (DAB). End of the Sewer Line. 157.2' DH. Severe Defect Replace Pipe 155' to 161' and Clean Deposits	\$69,948	\$94,430	
5		MAP 2 July-4	5		MAP 2 July-4	4	LAMPSON AVENUE	6/28/2012	1994	SPK110041	D/S	8	Clay Tile	240	201.7	1_Severe	4	103.2' BVV & 106.8' BSV & Deformed Horizontal Pipe 103.8'to.106.8'. MSA (BVV). Severe Defect Inspection Completed Replace Pipe 103.2' to 109.8'	\$94,621	\$127,738	
1	45		12				Garden Grove Bl./Rosewood Dr.	4/30/2004		SPN130005	DS	8	VCP	193	193	1_Severe	5	Replace pipe	\$76,091	\$102,723	
5		MAP 2-1-3	5				FLETCHER DR	7/12/2012	2627	SPN110036	D/S	8	VCP	330	355.5	1_Severe	5	346.4' & 350.6' BVV, 346.6' BSV, 347' Deformed Horizontal Pipe. Severe Defect Replace Pipe 185' to 188'(FM) & 338' to 354'	\$130,104	\$175,640	
5		MAP 4-B1-2	4				NOTTINGHAM AVE	9/10/2012	158	SPO220027	D/S	8	VCP	269	349	1_Severe	6	313' & 315.7' BVV, 313.9' Deformed Pipe. Severe Defect. Inspection Report shows 16.9' JOL. It was JOM & we changed it. Replace Pipe 311' to 317'	\$105,875	\$142,932	YES
5		June Map 2 B1	7				D ESTE DR	6/4/2012	4255	SPM020034	U/S	8	VCP	147	151.5	1_Severe	7	148' Deformed Vertical Pipe. Severe Defect. U/S MH is CO.	\$57,955	\$78,240	
2		S006	5				VOLKWOOD ST	10/18/2005		SPS110011	D/S	8	VCP	291	290.5	1_Severe	8	Replace Pipe 148' to 152' 3.3' JOL (D/SL)	\$114,531	\$154,616	
5		Map 1 May	2				BELGRAVE AVENUE	5/15/2012	1170	SPG090050	D/S	8	VCP	284	286.1	1_Severe	8	140.3' BVV & 269.8' BSV. Continuous Fractures & Cracks. Severe Defect Replace Or Reline Pipe	\$111,889	\$151,050	
5		MAP 1	14				CHAPMAN AVENUE	5/11/2012	1065	SPG090017	D/S	8	VCP	325	326	1_Severe	9	24.4' HVV, 127' & 213' BVV. Continuous FM. Severe Defect Replace Pipe 21' to 27', 124' to 130', 210' to 216' & Reline all pipe.	\$128,282	\$173,181	YES
5		MAP 3-B5	10				HAVENWOOD DRIVE	9/13/2012	4815	SPP140011	D/S	8	VCP	295	292	1_Severe	10	93.1' & 93.5' BSV, 244.2' BVV. Severe Defect Replace Pipe 92.8' to 96' & 240' to 246'	\$116,305	\$157,011	
5		June Map 2 B1	15				HEDLUND DR	6/7/2012	3610	SPM030026	D/S	8	VCP	330	332.3	1_Severe	11	303.3' HSV & 306.4' BVV. Severe Defect Replace Pipe 300' to 309'	\$130,104	\$175,640	
5		MAP 3-B3-1	20				LAMPSON AVENUE	8/2/2012	4408	SPP110039	D/S	8	Clay Tile	230	413.8	1_Severe	12	27.2' BSV & 358' JOL (D/SL) at Material Change Point. Severe Defect Replace Pipe 27' to 30' to BSV. Fix or Replace JOL @ 358'	\$90,678	\$122,416	

Table 5-5 (Continued)
Structural Replacement/Rehabilitation

Phase	Tape No.	DVD No.	Inspection No.	Reversal Tape No.	Reversal DVD No.	Reversal Inspec. No.	Location Street Name	CCTV Date	Pipe		Direction of Camera	Size (in)	Material	Length (ft)	CCTV Length (ft)	Priority	Ranking	Comments	Construct Costs (\$)	Total Cost (Const, Engin, Inspection, & Admin) (\$)	Completed
									Existing Sewer ID	Previous Sewer ID.											
5		MAP 4-B2-3	9				WESTMINSTER BOULEVARD	9/28/2012	5320	SPP170005	D/S	10	VCP	320	319.8	1 Severe	13	61.8' BVV & 163' JOL (D/SL). Severe Defect. Laterals at 188.6', 192.9' and 235.5' plugged with over 50% Deposits. Replace Pipe 61.8' to 65' & 163' to 166' and Clean Laterals by Home Owner	\$157,701	\$212,897	
5		MAP 3-5	15				GARY STREET	7/23/2012	5110	SPO080039	D/S	8	Clay Tile	277	270.9	1 Severe	14	253' JOL (D/SL) at Material Changing Point. 267.3' BVV . Severe Defect Replace Pipe 253 to 271	\$109,279	\$147,527	
5		MAP 3-6	1				9TH STREET	7/31/2012	6053	SPP110004	D/S	8	Clay Tile	312	312.4	1 Severe	15	46.7' BVV, 216.6' BSV. Severe Defect. @ 107.7' Unmapped MH Replace Pipe 42' to 47' & 215.9' to 221"	\$123,165	\$166,272	
5		MAP 3-B3-3	22				NUTWOOD STREET	8/22/2012	2378	SPN110002	D/S	8	VCP	55	94.9	1 Severe	16	94.9' MSA (HIGH WATER LEVEL_POSSIBLE OFFSET). 76.1' JOL (D/SL) 72.4' Small BVV. Severe Defect. No Reversal Video No Connection 11241 to 11143. Pipe ID is not correct. Ask City, Patch Repair BVV & Replace Pipe @ 76.1' at Material Changing Point	\$21,684	\$29,273	
5		MAP 3-B3-3	22				NUTWOOD STREET	8/22/2012	2379	SPN110003	D/S	8	VCP	100	94.9	1 Severe	17	Multiple reaches were evaluated with one inspection. 94.9' MSA (HIGH WATER LEVEL_POSSIBLE OFFSET). 76.1' JOL (D/SL) 72.4' Small BVV. Severe Defect. No Reversal Video No Connection 11241 to 11143. Pipe ID is not correct. Ask City, Patch Repair BVV & Replace Pipe @ 76.1' at Material Changing Point	\$39,425	\$53,224	
5		MAP 3-6	14				WESTLAKE STREET	7/27/2012	4932	SPO110014	U/S	8	Clay Tile	360	243.4	1 Severe	18	Multiple reaches were evaluated with one inspection. 9.7' JOL (D/SH) at Material Change Point & 241.7' BVV. 3 Times SAG. Severe Defect. No Reversal Video Replace Pipe 9.7' to 24.8' & 239' to 242'	\$141,931	\$191,607	
5		MAP 3-B3-2	7				TAFT STREET	8/20/2012	3836	SPO130010	D/S	8	VCP	140	134.8	1 Severe	19	21.7' & 112' Small BVV. Severe Defect Replace Pipe 19' to 24' & Patch Repair @ 112'	\$55,195	\$74,514	
5		MAP 3-3	4				EUCLID STREET	7/27/2012	5118	SPO100001	U/S	8	VCP	535	539	1 Severe	20	173.3' JOL (D/SH). Alignments & Sags. Severe Defect. After 462', Looks Like Abandoned pipe Replace Pipe 173.3' to 176.3'. Also Should Replace All Pipe	\$210,926	\$284,749	
5		MAP 4-B1-3	12				BALLAST AVE	9/11/2012	161	SPO230020	D/S	8	VCP	170	169.1	1 Severe	21	167.4' JOL (D/SH). Severe Defect Replace Pipe 163' to 168'	\$67,035	\$90,497	
5		MAP 3-5	9				STANFORD AVENUE	7/26/2012	5395	SPO120003	D/S	8	Clay Tile	460	473.5	1 Severe	22	2' JOL (D/SL) at Material Changing Point. Too Many Cracks & Fractures also Deposits. Severe Defect Replace Pipe 2' to 15.4'. Reline Pipe and Clean Deposits	\$181,357	\$244,831	
5		MAP 2 July-4	13				COVEY	6/26/2012	5042	SPM080033	D/S	8	Clay Tile	312	310.7	1 Severe	23	243.4' JOL (D/SL). Too many Fractures & Cracks. Severe Defect Replace Pipe 234.4' to 246.4'. Also Reline Pipe	\$123,007	\$166,060	
5		June Map 2 B1	64				HOMEWAY DRIVE	6/13/2012	5230	SPL060035	D/S	8	VCP	330	323.4	1 Severe	24	317' JOL (D/SL). Severe Defect Replace Pipe 317' to 321.5'	\$130,104	\$175,640	
5		MAP 3-B3-3	29				TAFT STREET	8/21/2012	3941	SPO140006	U/S	8	VCP	145	217.9	1 Severe	25	60.7' JOL (D/SL). Severe Defect. Unmarked MH @ 139.2'. Inspection Report Camera Direction was U/S, but it was D/S & we changed it. Replace Pipe 60.7' to 68.3'	\$57,167	\$77,175	
5		MAP 3-B5	15				NUTWOOD STREET	9/7/2012	2382	SPN110006	D/S	8	VCP	330	328.4	1 Severe	26	90.8' JOL (D/SL) @ Material Changing Point . Severe Defect Replace Pipe 90.8' to 112'	\$130,104	\$175,640	

Table 5-5 (Continued)
Structural Replacement/Rehabilitation

Phase	Tape No.	DVD No.	Inspection No.	Reversal Tape No.	Reversal DVD No.	Reversal Inspec. No.	Location Street Name	CCTV Date	Pipe		Direction of Camera	Size (in)	Material	Length (ft)	CCTV Length (ft)	Priority	Ranking	Comments	Construct Costs (\$)	Total Cost (Const, Engin, Inspection, & Admin) (\$)	Completed
									Existing Sewer ID	Previous Sewer ID											
5	MAP 3-5	6					ACACIA AVENUE	7/25/2012	2806	SPO120022	D/S	8	Clay Tile	330	328.6	1_Severe	27	73.1' JOL (D/SL) at Material change point. Too Much Fractures & Cracks. 4 Lateral (73',102.6', 199.1' & 232.2') have 50 % Grease. Severe Defect Replace Pipe 73.1' to 78.6'. Reline Pipe & clean Laterals.	\$130,104	\$175,640	
5	MAP 2-1-1	4					BROOKHURST STREET	7/6/2012	5368	SPM090005	D/S	8	VCP	260	265.6	1 Severe	28	263.3' JOL (D/SL) & Cracks. Severe Defect Replace Pipe 263.3' to 265.6' & Reline all Line	\$102,506	\$138,383	
5	MAP 3-B2-4	15					FREDRICK DRIVE	8/24/2012	4757	SPP090026	D/S	8	VCP	330	313.9	1_Severe	29	Same Inspection Map 3-B3-3 # 18. Use this one & delete other. Replace Pipe @ 311.4 to next joint	\$130,104	\$175,640	
5	MAP 2-1-4	13					SEACREST DRIVE	7/17/2012	5880	SPN080024	D/S	8	VCP	245	247.8	1_Severe	30	5' JOL (D/SL). Severe Defect Replace Pipe 5' to 7'	\$96,592	\$130,399	
5	MAP 4-B1-6	4					TRASK AVE	10/3/2012	421	SPR140021	D/S	10	VCP	46	70.5	1_Severe	31	18.4' JOL (D/SL). Severe Defect Replace Pipe 16.2' to 18.4'	\$22,423	\$30,271	
5	MAP 1	13					CHAPMAN AVENUE	5/11/2012	1066	SPG090018	D/S	8	VCP	350	348	1_Severe	32	294.1' BSV. Cracks & too many Fractures . Severe Defect Replace Pipe or Reline	\$137,989	\$186,285	
5	MAP 1	12					CHAPMAN AVENUE	5/11/2012	1321	SPG090058	D/S	8	VCP	350	348.1	1_Severe	33	98.7' BVV. Cracks & too many Fractures . Severe Defect Replace Pipe or Reline	\$137,989	\$186,285	YES
5	MAP 1	11					CHAPMAN AVENUE	5/11/2012	1173	SPG090053	D/S	8	VCP	303	300.6	1_Severe	34	43.3' BVV. Cracks & too many Fractures . Severe Defect Replace Pipe or Reline	\$119,317	\$161,078	
5	Map 1 May	5					VANGUARD AVENUE	5/16/2012	1475	SPG090036	D/S	8	VCP	213	211.2	1_Severe	35	83.1' BSV. Continuous Fractures & Cracks. Severe Defect. Pipe ID wasn't exist Reline Pipe	\$83,858	\$113,208	
5	Map 1 May	6					VANGUARD AVENUE	5/16/2012	1476	SPG090037	D/S	8	VCP	213	213.3	1_Severe	36	169.1' BVV. Continuous Fractures & Cracks. Severe Defect Reline Pipe	\$83,862	\$113,213	
5	Map 1 May	3					BELGRAVE AVENUE	5/15/2012	1171	SPG090051	D/S	8	VCP	300	279.5	1_Severe	37	25.4' BVV. Severe Defect Replace Pipe 23' to 29'	\$118,276	\$159,673	
5	MAP 3-5	14					WAKEFIELD AVENUE	7/23/2012	6604	SPP060007	D/S	8	Clay Tile	300	293.7	1_Severe	38	273.3' BSV. Fractures & Cracks. Severe Defect Replace Pipe 273.3' to 276' & Reline Pipe	\$118,276	\$159,673	YES
5	MAP 3-B3-4	31					STUART DRIVE	8/28/2012	3709	SPQ130002	D/S	8	VCP	305	298.2	1_Severe	39	174.2' Small BVV. Fractures. Severe Defect Patch Repair BVV & Reline Pipe	\$120,247	\$162,334	
5	MAP 3-B2-5	8					FALLINGLEAF STREET	8/28/2012	6547	SPS090011	D/S	8	VCP	388	392.3	1_Severe	40	387.6' BVV. Close to Ending MH. Severe Defect Replace Pipe 387.6' to 391' & Reline Pipe	\$153,018	\$206,574	
5	MAP 3-B3-3	28					TAFT STREET	8/21/2012	3942	SPO140007	D/S	8	VCP	340	252.6	1_Severe	41	50.2' Small BVV. Cracks & Fractures. Severe Defect. @ 181' Unmarked MH Patch Repair 50.2' & Reline Pipe	\$134,046	\$180,962	
5	MAP 3-6	11					STANFORD AVENUE	7/27/2012	4403	SPP120037	U/S	8	Clay Tile	407	406	1_Severe	42	221.4' BVV (Missing Pipe) Severe Defect Replace Pipe 221.4' to 224'	\$160,619	\$216,835	
5	MAP 2-2-2	9					GARDEN GROVE	7/20/2012	3375	SPK130004	U/S	8	Clay Tile	50	149.6	1_Severe	43	2.8' BVV. Severe Defect. Ending MH was as 8386. We checked GIS & Changed it. Replace Pipe 0' to 6'	\$19,713	\$26,612	
5	June Map 2 B1	91					MAGNOLIA STREET	6/15/2012	4240	SPL050054	D/S	8	VCP	247	258.3	1_Severe	44	257.5' HVV. Severe Defect Replace Pipe 254.5' to 257.5'	\$97,381	\$131,464	
5	June Map 2 B1	8					CHANTICLEER RD	6/4/2012	3487	SPL020006	D/S	8	VCP	290	287.3	1_Severe	45	234.5' HSV. Severe Defect Replace Pipe 234.5' to 237.5'	\$114,333	\$154,350	
5	MAP 3-B3-1	14					ALLEY E/OF MAIN STREET	8/3/2012	6763	SPP120027	D/S	6	Clay Tile	663	82.8	1_Severe	46	82.8' MSA (DAZ). 14.8' BVV. Severe Defect No Reversal (Video) Replace Pipe 14' to 17'	\$196,042	\$264,657	
5	May Folder 2	7		May Folder 2	8		OWEN STREET	5/29/2012	1622	SPF120031	D/S	8	VCP	258	261.3	1_Severe	48	Lateral @ 81.5 plugged 50 % Inspection Completed Replace pipe 19' to 24' & Clean lateral @ 81.5'	\$101,717	\$137,318	
5	MAP 3-B3-5	11					BONSER AVE	8/31/2012	3191	SPN100045	U/S	8	VCP	170	183	1_Severe	49	19.5' BSV. Severe Defect Replace Pipe 19.5' to 22.5'	\$67,023	\$90,481	
5	MAP 3-B3-1	5					GEORGE STREET	8/6/2012	4129	SPQ110005	D/S	8	VCP	340	346.5	1_Severe	50	19' BSV , Missing Pipe. There is an another utility pipe inside the broken part. Severe Defect Replace Pipe 17' to 20'	\$134,046	\$180,962	

Table 5-5 (Continued)
Structural Replacement/Rehabilitation

Phase	Tape No.	DVD No.	Inspection No.	Reversal Tape No.	Reversal DVD No.	Reversal Inspec. No.	Location Street Name	CCTV Date	Pipe		Direction of Camera	Size (in)	Material	Length (ft)	CCTV Length (ft)	Priority	Ranking	Comments	Construct Costs (\$)	Total Cost (Const, Engin, Inspection, & Admin) (\$)	Completed
									Existing Sewer ID	Previous Sewer ID											
5	June Map 2 B1		59				BROOKHURST STREET	6/13/2012	5014	SPM050017	D/S	10	VCP	282	237.4	1 Severe	52	55.4' BVV & JOM 55.4' & 58.5. Severe Defect Replace pipe 55.4 to 58.5'	\$138,974	\$187,615	
5	MAP 4-B1-5		1				HARBOR BLVD	9/26/2012	573	SPR160024	D/S	8	VCP	252	288.8	1 Severe	53	235.7' BVV. Severe Defect Replace Pipe 235.7' to 241'	\$99,353	\$134,127	
5	MAP 4-B2-1		29				RANCHERO WY	9/4/2012			D/S	6	VCP	277	277.1	1 Severe	54	274.5' BVV. Severe Defect. End of the Sever Lane Replace Pipe 270' to 277'	\$81,936	\$110,613	
5	MAP 4-B2-1		18				BARNETT WY	9/7/2012	4825	SPP150009	U/S	8	VCP	380	382	1 Severe	55	2.12' BVV. Severe Defect. Laterals at 186.7', 228.04', 288.10', 352.5', 373.3' over 50 % deposits. Replace Pipe 0 to 3' laterals should be cleaned by Home owners	\$149,816	\$202,252	
5	MAP 3-B2-1		9				9th STREET	8/7/2012	6323	SFP080005	D/S	8	VCP	380	378.7	1 Severe	56	Too Many Fractures & Cracks. Severe Defect. Laterals at 199.6', 272' & 340.8' have over 50% Grease. Reline Pipe & Clean Grease by Home Owner	\$149,816	\$202,252	
5	MAP 3-B2-1		10				9th STREET	8/7/2012	6322	SFP080004	D/S	8	VCP	395	395.6	1 Severe	57	Too Many Fractures & Cracks. Severe Defect. Laterals at 115.9', 184.5', 244.7', 313.2' & 385.3' have over 50% Grease. Reline Pipe & Clean Grease by Home Owner	\$155,730	\$210,236	
5	MAP 1		5				LAURELTON AVENUE	5/11/2012	1061	SPG090013	D/S	8	VCP	371	369.8	1 Severe	58	Continuous Cracks & Fractures. Severe Defect Replace Pipe or Reline	\$146,268	\$197,462	
5	MAP 1		10				CHAPMAN AVENUE	5/11/2012	1174	SPG090054	D/S	8	VCP	350	346.3	1 Severe	59	Cracks & too many Fractures . Severe Defect Replace Pipe or Reline	\$137,989	\$186,285	
5	MAP 2 July-1		2				CHAPMAN AVE	6/19/2012	5936	SPK090023	D/S	8	VCP	275	279.8	1 Severe	60	Cracks & too many Fractures . Severe Defect Replace Pipe or Reline	\$108,420	\$146,367	
5	MAP 2 July-1		1				CHAPMAN AVE	6/19/2012	5929	SPK090003	D/S	8	VCP	275	274.5	1 Severe	61	Cracks & too many Fractures . Severe Defect Replace Pipe or Reline	\$108,420	\$146,367	
5	MAP 2 July-1		5				MACNAB STREET	6/19/2012	5927	SPK080024	D/S	8	VCP	295	291.5	1 Severe	62	Cracks & too many Fractures . Severe Defect Replace Pipe or Reline	\$116,305	\$157,011	
5	Map 1 May		9				LAURELTON AVENUE	5/16/2012	1483	SPG090044	D/S	8	VCP	307	304.5	1 Severe	63	Continuous Fractures & Cracks. Severe Defect Reline Pipe	\$120,985	\$163,329	
5	MAP 3-B3-4		33				ALLEY	8/28/2012	4460	SPO130025	U/S	8	VCP	395	389.5	1 Severe	64	Continuous Fractures & Cracks. Severe Defect Reline Pipe	\$155,730	\$210,236	
5	MAP 3-B3-7		2				LAMPSON AVE	8/31/2012	6536	SPT100049	D/S	8	VCP	250	243.3	1 Severe	65	Continuous Fractures & Cracks. Severe Defect Should Reline	\$98,563	\$133,061	
5	Map 1 May		1				LAURELTON AVENUE	5/15/2012	1471	SPG090032	D/S	8	VCP	350	348	1 Severe	66	Continuous Fractures & Cracks. All Joints have DAE. Severe Defect Clean Deposits & Reline Pipe	\$137,989	\$186,285	
5	MAP 3-1		2				ALLEN DR	7/19/2012	2923	SPN100034	D/S	8	VCP	272	272.8	1 Severe	67	Cracks & Fractures. Severe Defect. Reline Pipe	\$107,237	\$144,770	
5	MAP 3-2		14				WAKEFIELD AVE	7/24/2012	6605	SPP060006	D/S	8	VCP	327	328.5	1 Severe	68	Cracks & Fractures. Severe Defect. Reline Pipe	\$128,921	\$174,043	
5	Map 1 May		4				BELGRAVE AVENUE	5/15/2012	1172	SPG090052	D/S	8	VCP	368	369	1 Severe	69	Continuous Fractures & Cracks. Severe Defect Reline Pipe	\$145,085	\$195,865	
5	MAP 3-2		7				EUCLID STREET	7/24/2012	6602	SPO060001	D/S	8	VCP	350	352.9	1 Severe	70	Cracks & Fractures. Severe Defect. Also 152' Tap Break Defective, Broken Pipe piece in the Lateral Reline Pipe. TBD should be fixed by Home owner	\$137,989	\$186,285	
5	MAP 4-B1-4		14				READING AVE	9/13/2012	2023	SPN170038	D/S	8	VCP	307	311.2	1 Severe	72	Too Many Crack & Fracture. Severe Defect Reline Pipe	\$121,036	\$163,398	
5	MAP 3-6		16				WESTLAKE STREET	7/26/2012	5398	SPO120007	D/S	8	Clay Tile	314	324.4	1 Severe	73	Cracks & Fractures. Severe Defect Should Reline	\$123,796	\$167,124	
5	MAP 4-B1-4		12				READING AVE	9/13/2012	2588	SPM170026	D/S	8	VCP	176	176.9	1 Severe	75	Too Many Crack & Fracture. Severe Defect Reline Pipe	\$69,231	\$93,462	
5	MAP 1		9				LAMPLIGHTER STREET	5/11/2012	2434	SPG090019	D/S	8	VCP	273	271.9	1 Severe	76	Cracks & Fractures . Severe Defect. Reline Pipe	\$107,513	\$145,142	
5	MAP 3-1		3				HACKAMORE RD	7/19/2012	2881	SPN090021	D/S	8	VCP	330	330.8	1 Severe	77	Cracks & Fractures. Severe Defect. Reline Pipe	\$130,104	\$175,640	

**Table 5-5 (Continued)
Structural Replacement/Rehabilitation**

Phase	Tape No.	DVD No.	Inspection No.	Reversal Tape No.	Reversal DVD No.	Reversal Inspec. No.	Location		CCTV Date	Pipe		Direction of Camera	Size (in)	Material	Length (ft)	CCTV Length (ft)	Priority	Ranking	Comments	Construct Costs (\$)	Total Cost (Const, Engr, Inspection, & Admin) (\$)	Completed
							Street Name	CCTV ID		Existing Sewer ID	Previous Sewer ID											
5	MAP 3-1		4				HACKAMORE RD	7/19/2012	2882	SPN090022	D/S	8	VCP	330	332.4	1_Severe	78	Cracks & Fractures. Severe Defect Reline Pipe	\$130,104	\$175,640		
5	Map 1		7				VANGUARD AVENUE	5/16/2012	1480	SPG090041	D/S	8	VCP	152	148.4	1_Severe	80	Continuous Fractures & Cracks. Severe Defect Reline Pipe	\$59,769	\$80,688		
5	MAP 3-1		1				ALLEN DR	7/19/2012	2879	SPN100031	D/S	8	VCP	280	242.7	1_Severe	81	Cracks & Fractures. Severe Defect Reline Pipe	\$110,391	\$149,028		
3		6	6				HAZARD	4/12/2007	316	SPN190001	D/S	10	VCP	362	359	2_Major	4	Spot repair at 14.30 ft FM and 245.60 ft FM. Clean pipe.	\$178,425	\$240,874		
1	17		3				10930 Grove St	3/5/2004		SPO120012	DS	8	VCP	500	500	2_Major	6	Replace pipe	\$197,127	\$266,121		
1	44		21				13121 Coast St.	4/27/2004	772	SPJ130024	DS	10	VCP	191	658	2_Major	7	Replace pipe	\$94,369	\$127,399		
1	45		26				9820 Garden Grove Blvd.	5/4/2004	2342	SPM130024	DS	6	VCP	299	299	2_Major	8	Replace pipe	\$88,411	\$119,355		
1	45		23	45		33	11262 Garden Grove Blvd.	5/4/2004		SPF130002-B	US	10	VCP	332	332	2_Major	9	Replace pipe	\$163,615	\$220,880		
2	MO11		6				ROBERT LN	8/25/2005	5856	SPO080056	D/S	8	VCP	157	152.4	2_Major	9	98.1' MINOR BROKEN PIPE (VV)	\$61,898	\$83,562		
1	45		18				9816 Garden Grove Blvd.	4/30/2004		SPM130001	DS	10	VCP	331	331	2_Major	10	Replace pipe	\$163,122	\$220,215		
1	14		18	14		19	10222 Russell	3/2/2004	2907	SPN140015	DS	6	VCP	365	367	2_Major	11	Replace pipe	\$107,927	\$145,701		
2	G046		10				VOLKWOOD ST	10/10/2005		SPS100024	D/S	8	VCP	321	320.8	2_Major	11	2 SAGS. HIGH FLOW	\$126,476	\$170,743		
1	43		11				8062 Garden Grove Blvd./Motel	4/22/2004	6835	SPJ130027	DS	8	VCP	315	313	2_Major	12	Replace pipe	\$124,068	\$167,491		
2	G046		9				VOLKWOOD ST	10/10/2005		SPS100023	D/S	8	VCP	342	341.8	2_Major	12	3 SAGS, 6' (DSL) JOM, HIGH FLOW	\$134,756	\$181,920		
1	11		27	12		1	13115 Pleasant St.	2/26/2004	2351	SPO130019	DS	6	VCP	360	371	2_Major	13	Replace pipe	\$106,448	\$143,705		
1	32		10				10000 Garden Grove Blvd.	4/1/2004		SPM130029	DS	10	VCP	314	314	2_Major	14	Replace pipe	\$154,744	\$208,905		
1	46		6				13371 Cypress St.	5/6/2004		SPO140048	DS	8	VCP	5	5	2_Major	16	Replace pipe	\$1,971	\$2,661		
1	8		20				12635 Main St.	2/18/2004	4791	SPO110004	DS	8	VCP	307	195	2_Major	19	Reline	\$120,878	\$163,185		
2	G030		5				CHAPMAN AV	8/29/2005	6274	SPO090059	D/S	12	VCP	265	258.5	2_Major	20	OBZ= OBS. BUILT INTO STRUCTURE POSITION.	\$156,716	\$211,566		
2	R064		5				EASEMENT	12/5/2005	558	SPS130014	D/S	8	VCP	382	383.0	2_Major	22		\$150,607	\$203,320		
2	R052		1				CHAPMAN AV	11/3/2005	6279	SPO090008	D/S	18	VCP	400	405.1	2_Major	23		\$354,828	\$479,018		
2	G027		8				TIMMY LN	8/23/2005	5643	SPR080018	D/S	8	VCP	241	242.1	2_Major	24	CONTINUOUS FRACTURE MULTIPLE	\$95,015	\$128,270		
2	G048		6				VOLKWOOD ST	10/17/2005		SPS110009	D/S	8	VCP	335	334.7	2_Major	27	SAG	\$131,957	\$178,141		
5	MAP 3-B3-2		13				CENTRAL AVENUE	8/10/2012	2492	SPO140033	D/S	6	VCP	320	328.4	2_Major	82	56.4' Small BVV. Major Defect Patch Repair	\$94,621	\$127,738		
5	MAP 3-5		19				ACACIA PARKWAY/ALLEY	7/27/2012	6926	SPO120014	U/S	8	Clay Tile	310	306	2_Major	83	198.1' BVV. Major Defect. Also Laterals @ 61.7' & 139.4' 75% Full of Grease Patch Repair BVV & clean Laterals	\$122,219	\$164,995		
5	MAP 3-B3-5		29				PARTRIDGE ST	8/29/2012	524	SPS130009	U/S	8	VCP	128	128.4	2_Major	84	60.3' BVV. 128.4' MSA (RBJ). No Reversal Video. Major Defect. Patch Repair 184.3'. Cut & Clean RBJ	\$50,622	\$68,340		
5	MAP 3-B3-1		30				8TH STREET	8/1/2012	5273	SPP110021	D/S	6	Clay Tile	325	325.2	2_Major	85	80.7' BVV. Major Defect. Ending MH was 11420. We checked GIS & changed it. Patch Repair	\$96,099	\$129,734		
5	MAP 2-2-2		3				MOEN STREET	7/2/2012	2068	SPJ070008	D/S	8	Clay Tile	111	108.7	2_Major	86	0' Small BVV. Major Defect Patch Repair	\$43,762	\$59,079		
5	MAP 3-B3-1		11				STANFORD AVENUE	8/3/2012	5140	SPP120018	D/S	8	VCP	334	329.5	2_Major	87	316' Small BVV. Major Defect Patch Repair	\$131,799	\$177,929		
5	June Map 1		5				KNOTT STREET	6/7/2012	1682	SPG090002	D/S	10	VCP	408	412.8	2_Major	88	327.6' BVV. Major Defect Patch Repair	\$201,069	\$271,443		
5	June Map 1		22				KNOTT STREET	6/27/2012	918	SPH120008	D/S	8	Clay Tile	427	424.8	2_Major	89	336.9' BSV. Major Defect Patch Repair	\$168,346	\$227,267		
5	MAP 4-B1-5		17				11th STREET	9/19/2012	527	SPM180005	D/S	8	VCP	283	282.6	2_Major	90	176.7' Small BVV. Major Defect. Inspection Report shows JOL @ 176.7'. It was JOM & we changed it Patch Repair	\$111,416	\$150,412		
5	MAP 3-B2-6		10				CHAPMAN AVE	8/30/2012	6027	SPT090020	U/S	10	VCP	320	296.8	2_Major	92	286.1' Small BSV. Major Defect Patch Repair	\$157,701	\$212,897		
5	Map 1 May		16				FAIRCHILD STREET	5/17/2012	986	SPE080004	D/S	8	VCP	260	257.1	2_Major	93	254.3' BVV. End of the Sewer Lane. Major Defect Patch Repair	\$102,506	\$138,383		
5	MAP 4-B1-5		2				HARBOR BLVD	9/26/2012	571	SPR160022	D/S	8	VCP	71	228	2_Major	94	7' Small BVV. Moderate Defect Patch Repair	\$28,136	\$37,964		
5	June Map 1		20				BELGRAVE AVE	6/27/2012	1409	SPE090035	D/S	8	VCP	350	353.3	2_Major	95	253.7' BSV. Major Defect Patch Repair	\$137,989	\$186,285		
5	Map 1 May		8				VANGUARD AVENUE	5/16/2012	1481	SPG090042	D/S	8	VCP	227	225.7	2_Major	96	Continuous Fractures & Cracks. Major Defect Reline Pipe	\$89,503	\$120,830		

Table 5-5 (Continued)
Structural Replacement/Rehabilitation

Phase	Tape No.	DVD No.	Inspection No.	Reversal Tape No.	Reversal DVD No.	Reversal Inspec. No.	Location	CCTV Date	Pipe		Direction of Camera	Size (in)	Material	Length (ft)	CCTV Length (ft)	Priority	Ranking	Comments	Construct Costs (\$)	Total Cost (Const, Engin, Inspection, & Admin) (\$)	Completed			
									Existing Sewer ID	Previous Sewer ID.														
							Street Name																	
5	MAP 3-B2-2		3				HOLYOAK LANE	8/16/2012	6562	SPR080005	D/S	8	VCP	345	353.8	2_Major	97	Cracks & Fractures. Major Defect Reline Pipe	\$136,200	\$183,871				
5	MAP 3-B2-2		1				HOLYOAK LANE	8/16/2012	6561	SPR080004	U/S	8	VCP	325	343.9	2_Major	98	Cracks & Fractures. Major Defect Reline Pipe	\$128,147	\$172,998				
5	MAP 3-6		17				WESTLAKE STREET	7/26/2012	5397	SPO120006	D/S	8	Clay Tile	336	336.1	2_Major	101	Inspection Report shows 11' BVV. This is RPP (Patch Repair). Too Many Fractures & Cracks. Major Defect Should Reline	\$132,647	\$179,074				
5	MAP 1		8				VANGUARD AVENUE	5/11/2012	1067	SPG090020	D/S	8	VCP	246	245	2_Major	102	Cracks & Fractures . Major Defect Reline Pipe	\$97,117	\$131,108				
5	MAP 3-B3-4		32				LEMONWOOD LANE	8/28/2012	4461	SPQ130026	D/S	8	VCP	205	201.1	2_Major	103	Inspection Report shows 77.3' & 115.6' BVV. Those are FM and we changed them. Cracks & Fractures, Major Defect Reline Pipe	\$80,931	\$109,256				
5	MAP 3-5		13				LAW DRIVE	7/24/2012	2922	SPN100033	D/S	8	Clay Tile	280	271.6	2_Major	104	Major Reline Pipe	\$110,540	\$149,228				
5	MAP 3-B3-1		24				LAMPSON AVENUE	8/2/2012	5087	SPP110012	D/S	6	Clay Tile	130	124.6	2_Major	105	Major Reline Pipe	\$38,491	\$51,963				
5	MAP 3-B2-5		11				FIREBRAND STREET	8/27/2012	6508	SPS090004	D/S	8	VCP	269	273.5	2_Major	106	Cracks & Fractures. Major Defect Reline Pipe	\$106,197	\$143,366				
5	MAP 3-B2-2		2				HOLYOAK LANE	8/16/2012	6563	SPR080006	D/S	8	VCP	265	256.5	2_Major	107	Cracks & Fractures. Major Defect Should Reline	\$104,618	\$141,234				
5	MAP 3-B2-5		10				FIREBRAND STREET	8/27/2012	6509	SPS090005	D/S	8	VCP	270	271.3	2_Major	108	Cracks & Fractures. Major Defect Reline Pipe	\$106,592	\$143,899				
5	MAP 2 July-1		14				DALE STREET	6/21/2012	1901	SPK070030	D/S	8	VCP	358	367	2_Major	111	Cracks & Fractures. Major Defect Reline Pipe	\$141,502	\$191,028				
5	MAP 3-1		5				HACKAMORE RD	7/20/2012	2880	SPN090020	D/S	8	VCP	350	355.4	2_Major	112	Cracks & Fractures. Major Defect Reline Pipe	\$138,174	\$186,535				
5	June Map 2 B1		68				KATELLA AVE	6/14/2012	1839	SPK050026	D/S	8	VCP	225	228.4	2_Major	113	Too many Cracks . Major Defect Should Reline	\$88,826	\$119,916				
5	MAP 4-B2-2		22				ALLEY	9/12/2012	334	SPK160028	D/S	8	VCP	264	262.5	2_Major	114	Fractures & Cracks. Major Defects. Should Reline	\$104,226	\$140,704	YES			
5	MAP 3-B5		22				NELSON STREET	9/6/2012	3024	SPO120017	D/S	6	VCP	150	200	2_Major	115	Too Many Crack. Major Defect Reline Pipe	\$44,413	\$59,958				
5	MAP 2-1-2		7				LANAKILA LN	7/10/2012	2670	SPM110026	D/S	8	VCP	240	241.6	2_Major	116	Cracks & Fractures. Major Defect Reline Pipe	\$94,748	\$127,910				
5	MAP 2-1-4		17				FAYE AVE	7/18/2012	2876	SPN090017	D/S	8	VCP	270	272.3	2_Major	117	Cracks & Fractures. Major Defect Reline Pipe	\$106,592	\$143,899				
5	MAP 3-B3-1		26				8TH STREET	8/2/2012	5278	SPP120007	D/S	8	Clay Tile	331	328	2_Major	118	Cracks & Fractures. Major Defect Should Reline	\$130,516	\$176,196				
5	MAP 3-B5		29				GARDEN GROVE	9/5/2012	4449	SPP130031	D/S	10	VCP	50	330.1	2_Major	119	Too Many Crack. Major Defect Reline Pipe	\$24,674	\$33,310				
5	June Map 2 B1		2				PARADE STREET	6/4/2012	3447	SPM90025	D/S	8	VCP	300	303.2	2_Major	120	300.7' Small BVV, end of the Sewer Lane. Major Defect Patch Repair	\$118,435	\$159,888				
							Totals															\$15,785,171	\$21,309,980	

Reaches that require extensive improvements that cannot be completed by the District (such as removal and replacement and/or lining) will be addressed by the District after the sewer capacity improvement projects have been implemented.

The District has implemented the capacity improvement projects at approximately \$4 million per year, and the rehabilitation/replacement projects at approximately \$1 million per year since 2005. District completed 85% of the capacity improvement projects by the year 2019. Most of the remaining capacity improvement projects needs coordination with neighboring cities. The District will implement the rehabilitation/replacement projects at approximately \$4 million per year, and the remaining capacity improvement projects at approximately \$1 million per year from the year 2020.

Follow-up CCTV Inspection and Condition Assessment Program

As structural deficiency mitigation projects are implemented, their condition will be reclassified, and they will be included in the appropriate category for follow up CCTV inspection and condition assessment work.

- Portions of the system rated as Severe will be inspected annually and evaluated to determine if immediate corrective action is needed.
- Portions of the system rated to be as **Major** will be CCTV inspected and evaluated once every three (3) years
- Portions of the system rated to be as **Moderate** will be CCTV inspected and evaluated once every five (5) years
- Portions of the system rated to be as **Minor** will be CCTV inspected and evaluated once every ten (10) years
- Portions of the system with no deficiencies will be CCTV inspected and evaluated once every ten (10) years
- Hot Spots, except siphons, will be CCTV inspected and evaluated before and after each maintenance activity and cleaning for one year to establish the appropriateness of the method, and then annually.

Following the system assessment program herein, the District has performed a Follow-up CCTV inspection and developed a rehabilitation plan for Phase I in 2018. Findings and newly identified rehabilitation/replacement projects can be found in the 2018 report.

D. STAFF TRAINING

Order 2006-0003-DWQ requires that the District “*provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained.*”

The District’s Preventative Maintenance Program details the training program and the certification requirements.

The District requires its staff members to obtain/maintain California Water Environment Association’s (CWEA) certification, which is the current industry standard for training and certifying sewer collection system

maintenance staff. Failure to meet these requirements may ultimately be a cause for termination or reassignment. Currently, the District staff members hold the following CWEA certification (shown in Table 5-6).

The District utilizes the following options to meet the requirements of its validated training program:

- Bi-weekly all hands safety training
- Annual confined space training
- Attendance of training sessions for new equipment and on the latest technologies
- Attendance of seminars and conferences on areas concerning sanitary sewer systems
- Attendance of classes on sanitary sewer systems

**Table 5-6
District CWEA Certification**

Sanitation Staff	Title	Email	CWEA Grade	CWEA Certification No.
Brent Hayes	Sanitation Supervisor	brenth@ci.garden-grove.ca.us	4	60124009
Frank Howenstein	Repair/Construction Foreman	frankh@ci.garden	3	90623004
Stephen Porras	Sanitation Foreman	Stevepoci.garden-grove.ca.us	3	607223037
Jose Gomez	Senior Sewer Maintenance Worker	joseg@ci.garden-grove.ca.us	2	80722112
Allen Kirzhner	Sewer Maintenance Worker	allenk@ci.garden-grove.ca.us	2	100522003
Jesse Viramontes	Senior Sewer Maintenance Worker	jessev@ci.garden-grove.ca.us	2	80122007
John Zavala	Heavy Equipment Operator	johnz@ci.garden-grove.ca.us	1	80721004
Victor Blas	Sewer Maintenance Worker	victorb@ci.garden-grove.ca.us	1	80721005
Frank De La Rosa	Sewer Maintenance Worker	frankd@ci.garden-grove.ca.us	1	100121007
Brandon Nunez	Utility Worker	brandonn@ci.garden-grove.ca.us	1	1308216493
Michael Guerrero	Utility Worker	mguerrero@ci.garden-grove.ca.us	1	1308220071

Training documentation includes date and time of training, agenda, the instructor, and the list of attendees.

The District bi-weekly internal training program includes topics that range from sanitary sewer overflow response to general health and safety to proper maintenance techniques.

The District requires its contractors who will perform flow monitoring, CCTV inspection, maintenance, repair, or replacement on the gravity system, as well as pump stations and force mains to possess the level of training and certifications appropriate for their duties. Determination of the appropriate training certification may be the responsibility of the contractor; however the District staff may require additional certification.

E. EQUIPMENT INVENTORY

Order 2006-0003-DWQ requires that the District must, *“provide equipment and replacement part inventories, including identification of critical replacement parts.”*

The current equipment inventory is included in the Preventative Maintenance Program and detailed in Appendix D-5. The equipment inventory is updated as equipment and materials are added or removed.

SECTION 6
DESIGN AND PERFORMANCE PROVISIONS

The Order requires that the District:

- (a) *Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for rehabilitation and repair of existing sewer systems; and*
- (b) *Procedures and standards for inspecting and testing the installation of new sewers, pump stations, and other appurtenances and for rehabilitation and repair projects.*

6-1 COMPLIANCE:

The documents used for design and performance evaluations include the following:

- Design Criteria for Sewer Facilities (Appendix E-1)
- Sewer Standard Drawings (Appendix E-2)
- Standards Specifications for Public Works Construction (Green Book)

The Design Criteria for Sewer Facilities document and standard plans that are on file at the Municipal Service Center and can be downloaded from the City of Garden Grove's official website:

<https://ggcity.org/pdf/pw/landdev/Sewer%20Standard%20Specs.pdf>

The Sewer Standard Drawings are on file at the Municipal Service Center and can be downloaded from the City of Garden Grove's official website:

<https://ggcity.org/pdf/pw/landdev/Series%20S.pdf>

A. STANDARDS FOR INSTALLATION, REHABILITATION, AND REPAIR

Order 2006-0003-DWQ requires that the District possess, "*Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for rehabilitation and repair of existing sewer systems.*"

Design Criteria for Sewer Facilities

Standards for design and construction of sewer facilities are included in the District's Design Criteria for Sewer Facilities document. Topics covered in this document include, but are not limited to the following:

Minimum Pipe Size	Minimum Velocity
Pipe Depth to Diameter Ratio	Minimum and Maximum Slope
Design Flow Criteria	Standard Location and Alignment
Stationing Procedure	Minimum Depth
Sewer Pipe Material	Manhole Design Requirements
Clean-Outs	Separation Requirements between Utilities

House Laterals
Sewer Pump Station Design Requirements

Private Sewer System
Standard Sewer Notes

Sewer Standard Drawings

The District's Sewer Standard Drawings include details for manholes, laterals, joints, cleanouts, bedding, concrete encasements, concrete slope anchors, steel casing pipes, wye connections, PVC liner, gas flap installation, grease interceptors, and criteria for separation of water and sewer mains.

As part of this SSMP update, the District has updated its Sewer Standard Drawings.

B. STANDARDS FOR INSPECTION AND TESTING OF NEW, REHABILITATED AND REPAIRED FACILITIES

Order 2006-0003-DWQ requires that the District possess, "*Procedures and standards for inspecting and testing the installation of new sewers, pump stations, and other appurtenances and for rehabilitation and repair projects.*"

Standards for the inspection and testing of the District's sewer facilities are included in the Design Criteria for Sewer Facilities document and the American Public Works Association Standard Specification and Drawings for Public Works Construction ("The Greenbook"). The inspection and testing procedures shall adhere to the following:

- CCTV Inspection (Greenbook 306-1.4.1)
- Water Exfiltration Testing (Greenbook 306-1.4.2)
- Water Infiltration Testing (Greenbook 306-1.4.3)
- Air Pressure Test (Greenbook 306-1.4.4)
- Water Pressure Test (Greenbook 306-1.4.5)
- Equipment Installation and Testing (Design Criteria for Sewer Facilities 17.28)

SECTION 7 OVERFLOW EMERGENCY RESPONSE PLAN

The Order requires that at a minimum Overflow Response Plan must include:

- (a) *Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;*
- (b) *A program to ensure appropriate response to all overflows;*
- (c) *Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially effected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the MRP (Monitoring and Reporting Program). All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Board WDRs or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification;*
- (d) *Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;*
- (e) *Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and*
- (f) *A program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewaters to waters of the United States and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and the impact of the discharge.*

7-1 COMPLIANCE

The District has developed a stand-alone Overflow Emergency Response Plan (OERP) to comply with the aforementioned Waste Discharge Requirements. The District's Overflow Emergency Response Plan was updated in December 2019 and included in Appendix E-3.

A. INITIAL NOTIFICATION PROCEDURES

Order 2006-0003-DWQ requires that at a minimum, the OERP must include "*proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;*" An overflow may be detected by District employees or by others. To report a spill the public can call the following:

Garden Grove Municipal Services Center	(714) 741 – 5395 (Business hours)
Police Dispatch	9 – 1 – 1 (After Hours)

The City of Garden Grove's website include the telephone number to call in the event of a sewer overflow:

<https://ggcity.org/sewers>

B. SSO RESPONSE

Order 2006-0003-DWQ requires that at a minimum, the SSOERP must include, “A program to ensure appropriate response to all overflows.”

The Overflow Emergency Response Plan document includes a step-by-step procedure to respond to all types of sanitary sewer overflows. The report details the response procedure for the following spill events:

- Gravity sewer spills
- Pump station failure
- Force main leak
- Spills from District’s sewer system that terminate in Orange County Public Works storm drain facilities
- Private Spill
- Spills originating from OCSD sewers
- Spills originating from the Cities of Anaheim, Orange, Stanton, Westminster, Santa Ana, and Midway Sanitary District sewers

C. NOTIFYING THE APPROPRIATE REGULATORY AGENCIES

Order 2006-0003-DWQ requires that at a minimum, the OERP must include “procedures to ensure prompt notification to appropriate regulatory agencies and other potentially effected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the MRP (Monitoring and Reporting Program). All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Board WDRs or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification;”

Spill report receipts from the public during business hours are directed to the City’s Water Services Division main office and then forwarded to the Sanitation Supervisor, Foreman, and other key staff. The District’s Overflow Emergency Response Plan includes a comprehensive contact list, including the telephone numbers of individuals that may need to be reached in the event of a sanitary sewer spill. This list includes, but is not limited to the following:

- State Office of Emergency Services (Current SSOERP identifies the agency as California Emergency Management Agency)
- Orange County Public Works (Orange County Flood Control District)
- Regional Water Quality Control Board
- Orange County Health Care Agency
- Nearby Sewer Agencies
- On-Call Contractors
- Orange County Sanitation District
- Garden Grove Fire Department
- Garden Grove Police Department
- Environmental Consultant

The Overflow Emergency Response Plan includes procedures for reporting all spills electronically, to the State Water Resources Control Board (SWRCB) California Integrated Water Quality System (CIWQS) website, (<http://ciwqs.waterboards.ca.gov/>). In doing so, District’s spills are automatically added to the Statewide Sanitary Sewer Overflow Database. The Water Services Manager, Sanitation Supervisor, and Sanitation Foreman are registered to submit draft and certified reports on the CIWQS website.

D. TRAINING

Order 2006-0003-DWQ requires that at a minimum, the OERP must include “*procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained.*”

The District’s Overflow Emergency Response Plan includes the requirement to ensure its staff is properly trained on the overflow emergency response procedures. Training consists of annual office and annual in-the field training.

E. ADDITIONAL RESPONSE ACTIVITIES

Order 2006-0003-DWQ requires that at a minimum, the OERP must include “*procedures to address emergency operations, such as traffic and crowd control and other necessary response activities.*”

The Overflow Emergency Response Plan document includes the procedures to address emergency operations which include traffic control, crowd control, and public notification:

F. PREVENTION OF DISCHARGE OF WASTEWATERS TO SURFACE WATERS AND IMPACT ON ENVIRONMENT

Order 2006-0003-DWQ requires that at a minimum, the OERP must include “*a program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewaters to waters of the United States and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and the impact of the discharge.*”

The SSOERP includes the procedures to minimize the impact of a sanitary sewer overflow. In the event that a sewer overflow reaches waters of the State, the District shall adhere to the monitoring requirements of Orange County Health Care Agency. The District’s Environmental Consultant will also be contacted to assess the sewer overflow.

SECTION 8
FATS, OILS, AND GREASE CONTROL PROGRAM

The Order requires:

The District shall evaluate its service area to determine whether a FOG control program is needed. If the District determines that a FOG program is not needed, the District must provide justification for why it is not needed. If FOG is found to be a problem, the District must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. This plan shall include the following as appropriate:

- (a) An implementation program and schedule for a public education outreach program that promotes proper disposal of FOG;*
- (b) A plan and a schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;*
- (c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;*
- (d) Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, Best Management Practices (BMP) requirements, record keeping and reporting requirements;*
- (e) Authority to inspect grease producing facilities, enforcement authorities, and whether the enrollee has sufficient staff to inspect and enforce the FOG ordinance;*
- (f) An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section ; and*
- (g) Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (F) above.*

8-1 COMPLIANCE

The District initially completed and certified its FOG Control Program on May 1, 2009. As part of this SSMP report document, the District has provided an updated and expanded FOG Control Program that complies with the aforementioned Waste Discharge Requirements.

A. EDUCATION AND OUTREACH

Order 2006-0003-DWQ requires the District to manage “*an implementation program and schedule for a public education outreach program that promotes proper disposal of FOG*”.

The District’s public education and outreach program includes topics such as proper Fats, Oils, and Grease (FOG) disposal procedures, kitchen best management practices, grease control device maintenance, etc. The District’s outreach consists of the following:

- FOG Control Program for FSEs document provided to Food Service Establishments (FSEs) (Appendix F-1)

- FOG control and Sanitary Sewer Overflow (SSO) prevention brochures (Appendix F-2)
- Water utility bill inserts
- Grease lids and information for proper disposal for residents that have had a FOG induced spill.
- Public awareness at school outreach events and municipal events
- Outreach media – i.e. rulers, notepads, bracelets, pens and pencils
- Sewer saver display
- Knock the Grease Goblin out of the Sewer game

The public informational material regarding proper FOG disposal is provided in the following languages: English, Spanish, Korean, and Vietnamese. The District also posts educational information on the City of Garden Grove's website:

<https://ggcity.org/environmental-compliance/environmental-compliance-businesses>

B. FOG DISPOSAL

Order 2006-0003-DWQ requires the District to implement “*a plan and a schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area.*”

A list of liquid waste haulers that are registered with the County of Orange Health Care Agency is provided to the FSEs, and included in Appendix F-3. The list details waste haulers that are capable of servicing grease interceptors and grease traps.

Orange County Sanitation District (OCSD) treatment facilities are the approved locations for disposal of FOG and wash water disposal.

C. LEGAL AUTHORITY

Order 2006-0003-DWQ requires the District to possess “*the legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG*”

The District's Code of Regulations (Appendix C-1) and Ordinance No. 6 (Appendix C-3), FOG Control Regulations Applicable to FSEs, provide the legal authority to regulate the FOG discharges and identify measures to prevent SSOs and blockages caused by FOG. It prohibits FSEs from the following activities:

- Disposing wastewater with FOG concentrations of more than 200 ppm, into the sewer collection system (**Code of Regulations, Section 4.10.050**)
- Using food grinders (**Ordinance No. 6, Section 4.30.030A**)
- Adding FOG emulsifying agents or biological additives to the system (**Ordinance No. 6, Section 4.30.030B**)
- Discharging cooking wastes to the system (**Ordinance No. 6, Section 4.30.030C**)
- Discharging wastewater from dishwashers to grease control devices (**Ordinance No. 6, Section 4.30.030D**)
- Discharging wastewater with temperatures greater than 140°F into a grease control device (GCD).

(Ordinance No. 6, Section 4.30.030E)

- Introducing biological additives for grease remediation, without FOG Control Program Manager's approval **(Ordinance No. 6, Section 4.30.030F)**
- Discharging waste from toilets, urinals, washbasins, and other fixtures that handle fecal material to the sewer system that is attached to the GCD **(Ordinance No. 6, Section 4.30.030G)**
- Discharging wastes from Grease Control Devices (GCD) into the sewer system **(Ordinance No. 6, Section 4.30.030H)**

Ordinance No. 6 also provides the District the authority for the following:

- The District may require the installation of a grease interceptor **(Ordinance No. 6, Section 4.30.050A&B)**.
- The District requires the food service establishments to comply with Best Management Practices including the removal of food grinders, proper employee training, installation of grease traps, use of grease rendering containers, and proper documentation **(Ordinance No. 6, Section 4.30.050C)**
- Commercial property owners are responsible for the installation of grease interceptors when multiple food service establishments are located on a single parcel. **(Ordinance No. 6, Section 4.30.070)**
- If the District must respond to a sanitary sewer overflow that originates from FSEs, the property owner will be responsible to pay the cost for the District's containment and clean up effort. **(Ordinance No. 6, Section 4.30.080)**
- FSEs are required to submit two (2) copies of site, mechanical, and plumbing plans regarding new or existing grease interceptors, grease traps, monitoring facility, and/or metering facility. These drawings may require signature by a civil, chemical, mechanical, or electrical engineer. **(Ordinance No. 6, Section 4.30.090A&B)**
- FSEs with grease interceptors must comply with the District's requirements for sizing, installation, access, and maintenance. **(Ordinance No. 6, Section 4.30.100)**
- Grease traps may be required when excess grease may be introduced into the District's sewer system. FSEs must comply with the District's requirements which include but are not limited to permitting, equipment sizing, maintenance, inspection, and prohibitions. **(Ordinance No. 6, Section 4.30.110)**
- As necessary, the District may require FSEs to construct any monitoring and sampling facilities to inspect the efficiency of the FSEs' grease interceptors or grease traps. **(Ordinance No. 6, Section 4.30.120)**
- The District has the legal authority to inspect all FSEs to ensure that they are in compliance with the District's Code of Regulations and Ordinance 6. **(Ordinance No. 6, Section 4.30.130)**
- The District requires FSEs to report the discharge of any material, including FOG, to the sewer system since it may lead to sewer blockages and/or spills. FSEs are required to contact the appropriate local Health Department, City, District, and the FOG Control Program Manager. **(Ordinance No. 6, Section 4.30.140)**
- The District has the legal authority to enforce the requirements included in the District's Code of Regulations and Ordinance 6. **(Ordinance No. 6, Section 4.30.150)**

The terms used throughout Ordinance No. 6 and throughout this document have been defined as the following:

Best Management Practices(Structural and Non-Structural)	Schedules of activities, prohibitions of practices, maintenance procedures, installation of equipment, and other management practices to control and limit the introduction of FOG to sewer facilities.
Board	The Board of Directors of the District.
Change in Operations	Any change in the ownership, food types, or operational procedures that have the potential to increase the amount of FOG generated and/or discharged by Food Service Establishments in an amount that alone or collectively causes or creates a potential for SSOs to occur.
Composite Sample	A collection of individual samples obtained at selected intervals based on an increment of either flow or time. The resulting mixture (composite sample) forms a representative sample of the waste stream discharged during the sample period. Samples will be collected when a wastewater discharge occurs.
Discharger	Any person who discharges or causes a discharge of wastewater directly or indirectly to a public sewer and/or stormwater drain system. Discharger shall mean the same as User.
District	The Garden Grove Sanitary District.
Sewer Facility or System	Any property belonging to the District used in the treatment, reclamation, reuse, transportation, or disposal of wastewater.
Effluent	Any liquid outflow from the Food Service Establishment that is discharged.
Fats, Oils, and Grease ("FOG")	Any substance such as a vegetable or animal product that is used in, or is a byproduct of, the cooking or food preparation process, and that turns or may turn viscous or solidifies with a change in temperature or other conditions.
FOG Control Program	The FOG Control Program required by and developed pursuant to RWQCB Order No. RS- 2002-0014, Section (c)(12)(viii).
FOG Control Program Manager	The individual designated by the District to administer the FOG Control Program. The FOG Control Program Manager is responsible for all determinations of compliance with the program.
Food Service Establishment	Facilities defined in California Uniform Retail Food Service Establishments Law (CURFFL) Section 113785, and any commercial entity within the boundaries of the District, operating in a permanently constructed structure such as a room, building, or place, or portion thereof, maintained, used, or operated for the purpose of storing, preparing, serving, or manufacturing, packaging, or otherwise handling food for sale to other entities, or for consumption by the public, its members or employees, and which has any process or device that uses or produces FOG, or grease vapors, steam, fumes, smoke or odors that are required to

	be removed by a Type I or Type II hood, as defined in CURFFL Section 113785. A limited food preparation establishment is not considered a Food Service Establishment when engaged only in reheating, hot holding or assembly of ready to eat food products and as a result, there is no wastewater discharge containing a significant amount of FOG. A limited food preparation establishment does not include any operation that changes the form, flavor, or consistency of food.
Food Grinder	Any device installed in the plumbing or sewage system for the purpose of grinding food waste or food preparation by-products for the purpose of discharging it into the sanitary sewer collection system
Grease Control Device	Any grease interceptor, grease trap or other mechanism, device, or process, which attaches to, or is applied to, wastewater plumbing fixtures and lines, the purpose of which is to trap or collect or treat FOG prior to it being discharged into the sewer system. "Grease control device" may also include any other proven method to reduce FOG subject to the approval of the District.
Grease Interceptor	A multi-compartment device that is constructed in different sizes and is generally required to be located, according to the California Plumbing Code, underground between a Food Service Establishment and the connection to the sewer system. These devices primarily use gravity to separate FOG from the wastewater as it moves from one compartment to the next. These devices must be cleaned, maintained, and have the FOG removed and disposed of in a proper manner on regular intervals to be effective.
Grease Trap	A grease control device that is used to serve individual fixtures and have limited effect and should only be used in those cases where the use of a grease interceptor or other grease control device is determined to be impossible or impracticable.
General Manager	The individual duly designated by the Board of Directors of the District to administer this Ordinance.
Grab Sample	A sample taken from a waste stream on a onetime basis without regard to the flow in the waste stream and without consideration of time.
Hot Spots	Areas in sewer lines that have experienced sanitary sewer overflows resulting in the need for frequent maintenance and cleaning.
Inflow	Water entering a sewer system through a direct stormwater runoff connection to the sanitary sewer, which may cause an almost immediate increase in wastewater flows.
Infiltration	Water entering a sewer system, including sewer service connections, from the ground through such means as defective pipes, pipe joints, connections, or manhole walls.

Inspector	A person authorized by the District to inspect any existing or proposed wastewater generation, conveyance, processing, and disposal facilities
Interceptor	A grease interceptor.
Interference	Any discharge which, alone or in conjunction with discharges from other sources, inhibits or disrupts the District's sewer system, treatment processes or operations; or is a cause of violation of the District's NPDES or Waste Discharge Requirements or prevents lawful sludge use or disposal.
Local Sewering Agency	Any public agency or private entity responsible for the collection and disposal of wastewater to the District's sewer facilities duly authorized under the laws of the State of California to construct and/or maintain public sewers.
NPDES	The National Pollutant Discharge Elimination System; the permit issued to control the discharge of liquids or other substances or solids to surface waters of the United States as detailed in Public Law 92-500, Section 402.
New Construction	Any structure planned or under construction for which a sewer connection permit has not been issued.
Person	Any individual, partnership, firm, association, corporation or public agency, including the State of California and the United States of America.
Prohibited Discharge	Any discharge which contains any pollutant, from public or private property to (i) the stormwater drainage system; (II) any upstream flow, which is tributary to the stormwater drain system; (III) any groundwater, river, stream, creek, wash or dry weather arroyo, wetlands area, march, coastal slough, or (iv) any coastal harbor, bay or the pacific Ocean.
Public Agency	The State of California and/or any city, county, special district, other local governmental authority or public body of or within this State.
Public Sewer	A sewer owned and operated by the District, or other local Public Agency, which is tributary to the District's sewer facilities.
Regulatory Agencies	Regulatory Agencies shall mean those agencies having regulatory jurisdiction over the operations of the District, including, but not limited to: a) United States Environmental Protection Agency, Region IX, San Francisco and Washington, DC (EPA). b) California State Water Resources Control Board (SWRCB). c) California Regional Water Quality Control Board, Santa Ana Region (RWQCB). d) South Coast Air Quality Management District (SCAQMD). e) California Department of Health Services (DOHS).

Remodeling	A physical change or operational change causing generation of the amount of FOG that exceed the current amount of FOG discharge to the sewer system by the Food Service Establishment in an amount that alone or collectively causes or create a potential for SSOs to occur; or exceeding a cost of \$50,000 to a Food Service Establishment that requires a building permit, and involves anyone or combination of the following: (1) Under slab plumbing in the food processing area, (2) a 30% increase in the net public seating area, (3) a 30% increase in the size of the kitchen area, or (4) any change in the size or type of food preparation equipment.
Sample Point	A location approved by the District, from which wastewater can be collected that is representative in content and consistency of the entire flow of wastewater being sampled.
Sampling Facilities	Structure(s) provided at the user's expense for the District or user to measure and record wastewater constituent mass, concentrations, collect a representative sample, or provide access to plug or terminate the discharge.
Sewer System Overflow (SSO)	A sanitary sewer system overflow (SSO), or sewage spill, is each instance of a discharge of sewage from a sanitary sewer system.
Sewage	Wastewater
Sewer Facilities or System	Any and all facilities used for collecting, conveying, pumping, treating, and disposing of wastewater and sludge.
Sewer Lateral	A building sewer as defined in the latest edition of the California Plumbing Code. It is the wastewater connection between the building's wastewater facilities and a public sewer system.
Sludge	Any solid, semi-solid or liquid decant, subnate or supernate from a manufacturing process, utility service, or pretreatment facility.
Stormwater Drainage System	Street gutter, channel, storm drain, constructed drain, lined diversion structure, wash area, inlet, outlet or other facility, which is part of or tributary to the county-wide stormwater runoff system and owned, operated, maintained or controlled by County of Orange, the Orange County Flood Control District or any city, and used for the purpose of collecting, storing, transporting or disposing of stormwater.
User	Any person who discharges or causes a discharge of wastewater directly or indirectly to a public sewer system. User shall mean the same as Discharger.
Waste	Sewage and any and all other waste substances, liquid, solid, gaseous or radioactive, associated with human habitation or of human or animal nature, including such wastes placed within containers of whatever nature prior to and for the purpose of disposal.
Manifest	That receipt which is retained by the generator of wastes for disposing recyclable wastes or liquid wastes as required by the District.

Waste Minimization Practices	Plans or programs intended to reduce or eliminate discharges to the sewer system or to conserve water, including, but not limited to, product substitutions, housekeeping practices, inventory control, employee education, and other steps as necessary to minimize wastewater produced.
Waste hauler	Any person carrying on or engaging in vehicular transport of waste as part of, or incidental to, any business for that purpose.
Wastewater	The liquid and water-carried wastes of the community and all constituents thereof, whether treated or untreated, discharged into or permitted to enter a public sewer.
Wastewater Constituents and Characteristics	The individual chemical, physical, bacteriological, and other parameters, including volume and flow rate and such other parameters that serve to define, classify or measure the quality and quantity of wastewater.

D. GREASE REMOVAL DEVICES

Order 2006-0003-DWQ requires the District to possess “*requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, Best Management Practices (BMP) requirements, record keeping and reporting requirements.*”

Ordinance No. 6, FOG Control Regulations Applicable to FSEs, describe the FOG control regulations and requirements regarding installation, maintenance, best management practices, record keeping, and reporting for grease removal devices.

Grease Interceptors

Installation Requirement – Grease interceptors are required during the construction of new FSEs. The FOG Program Manager also has the authority to require the installation of grease control devices at FSEs that are responsible or that have contributed to an SSO.

Design Standards– Ordinance No.6, states that “*Grease interceptor sizing shall conform to the current edition of the California Plumbing code. Grease interceptors shall be constructed in accordance with the design approved by the FOG Control Program Manager and shall have a minimum of two compartments with fittings designed for grease retention.*”

The District has prepared a standard plan for grease interceptors, which is included in Appendix E-2. All new grease interceptors shall be designed and constructed to these standards.

Maintenance Requirements – FSE’s are required to fully pump out and clean their grease interceptors on a schedule approved by the District’s FOG Control Manager. Generally the grease interceptor cleaning should be performed before the FOG and solids exceed 25% of the interceptor capacity. Historical data regarding the grease accumulation time and solids level are used to create the inspection schedule. Interceptors are required to be cleaned every six (6) months, at minimum. Currently, the District monitors the FSE’s cleaning logs to verify that the cleaning is performed as scheduled and to make any changes to the cleaning frequency

as the District determines is necessary.

If at any time the FOG and solid accumulation within a grease interceptor is greater than 25%, FSEs shall fully pump out and clean the grease interceptor.

Grease Traps

Installation Requirement – Where FOG may be introduced into a system, FSEs may be required to install grease traps on fixtures prior to receiving a Garden Grove Plumber’s permit.

Design Standards– Ordinance No.6, states that “*Sizing and installation of grease traps shall conform to the current edition of the California Plumbing Code.*”

Maintenance Requirements – FSEs are required to maintain their grease traps per a schedule approved by the District’s FOG Control Program Manager. Accumulated grease will be removed as part of the maintenance procedures.

Grease Removal Device Requirements

Best Management Practices - Best Management Practices (BMPs) must be implemented to limit the discharge of FOG to the sewer collection system. Kitchen BMPs are detailed in the FOG Control Program for FSEs document, which is included in Appendix F-1. The kitchen BMPs include the requirements regarding drain screens, grease containers, dishwashing, spill prevention, usage of absorbent materials and towels, and food waste disposal.

Record Keeping and Reporting – The District requires all documents be retained for a minimum of 5 years. This includes training records, grease control device maintenance and cleaning records, private spill records, plumbing maintenance records, grease hauling records, and any other information regarding the District’s FOG Control Program.

FSEs are required to keep records of all maintenance inspections. At minimum, the District requires the FSE’s to log the following information on its maintenance logs:

- Date of Inspection
- Company and Person performing inspection
- Type of Service (Pumping/hauling, repairs, etc)
- Disposal Site
- Estimated Volume Pumped
- Service Comments
- For grease interceptors, the FOG and solid accumulation level shall also be tracked.

E. FSE INSPECTIONS

Order 2006-0003-DWQ requires the District to possess the “*authority to inspect grease producing facilities, enforcement authorities, and whether the enrollee has sufficient staff to inspect and enforce the FOG ordinance.*”

For new FSEs, the District performs a one-time comprehensive inspection, consisting of an evaluation of the FSE’s operations, wastes produced, process conducted, FOG sources, kitchen equipment, grease control devices, waste hauling activities, BMPs, and lateral maintenance.

In addition to the comprehensive initial inspection, the District conducts annual inspections at each FSE. The inspections may be conducted during normal business hours at the consent of the owner or with an administrative inspection warrant. Ordinance No. 6 provides the District the necessary legal authority to inspect FSEs and to enforce any non-compliance to the District’s FOG Control Program. FSEs shall provide the District access to all grease control devices, monitoring or metering facilities, and the local stormwater system. The FOG Control Program Manager may require FSEs to construct monitoring or metering facilities, as needed for proper maintenance and inspection.

Authorized inspectors also have complete access to all training records, grease hauler manifests, maintenance records, and any other information relating to the FOG Control Program. The authorized inspector may sample and test any area runoff, groundwater, process discharge, and/or treatment system discharge. The authorized inspector may perform smoke and dye tests or require closed circuit television inspections of the private sewers. Photographs and videos may also be taken during the inspection.

During each annual inspection, the authorized inspector will review all maintenance records, conduct visual inspections, and perform any other tests as needed to evaluate the FSEs compliance with the requirements of Ordinance No. 6 and any permits issued to the FSEs. The requirements include but are not limited to:

- Product waste produced by the FSEs meet the current permitting requirements
- Processes conducted by the FSEs meet the current permitting requirements
- Chemicals used and stored on the property meet the current permitting requirements
- Illicit connections to the sewer system and/or grease control devices are prohibited
- Restriction of wastewater with FOG concentrations of more than 200 ppm, into the sewer collection system. Prohibition of cooking waste or wastes from grease control devices to be discharged to the sewer system.
- Prohibition of food grinders
- Restrictions of adding FOG emulsifying agents or biological additives to the system. Prohibition of biological additives added to system for grease remediation, without FOG Control Program Manager’s approval.
- Prohibiting the discharge of wastewater from dishwashers to grease control devices and restrictions of wastewaters with temperatures greater than 140°F
- Prohibition of discharging waste from toilets, urinals, washbasins, and other fixtures that handle fecal material to the sewer system that is attached to the grease control devices.
- FSEs do not meet the minimum requirements for proper Kitchen Best Management Practices, as detailed in the FOG Control Program for FSEs (Appendix F-1)

Follow-up inspections may be required when a violation has the potential of resulting in a SSO, such as when a FSE has a history of multiple spills or if a grease control device is in urgent need of cleaning and/or maintenance. The District will notify the FSE in writing, of any violation to Ordinance No. 6 or any permit, and it will include the corrective action to bring the FSE into compliance. Corrective actions typically consist of repairing broken facilities or installing grease control devices. For lesser infractions, such as incomplete maintenance records and logs, the FSEs may be required to fax additional information to the District.

The District performs annual inspections at the FSEs to ensure that they are complying with the regulations of Ordinance No. 6. The District has the power to enforce fines or imprisonment for violations of severe nature.

F. FOG CLEANING AND MAINTENANCE SCHEDULE

Order 2006-0003-DWQ requires the District to plan “*an identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section.*”

Reaches that require additional cleaning have been identified from CCTV inspections, cleaning records, manhole inspections, spill history. Additional cleaning may be necessary to prevent spills caused by FOG, roots, clogged siphons, and undersized pipes.

The District provides additional cleaning for the hot spot reaches on the following interval:

- Monthly (76 Reaches)
- Quarterly (63 Reaches)
- Semiannually (48 Reaches)
- Monthly – Inspection Only (52 Reaches)
- Quarterly – Inspection Only (12 Reaches)
- Semiannually – Inspection Only (11 Reaches)

The District evaluates the inspection reports and SSO history annually to determine if additional FSEs need to install grease control devices, if the Hot Spot cleaning list needs to be updated, or if additional requirements need to be added to the District’s FOG Control Program.

G. SOURCE CONTROL MEASURES

Order 2006-0003-DWQ requires the District’s plan to include “*development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (f) above.*”

The District has complied with this requirement by:

- Providing public education and outreach programs with regards to FOG control
- Adopting Ordinance No. 6
- Developing and distributing a FOG Control for FSEs document
- Requiring grease interceptors at FSEs
- Inspecting FSEs – BMPs and grease interceptors

- Identifying sewer Hot Spots, including those due to FOG
- Providing frequent cleaning of sewer Hot Spots related to FOG

SECTION 9
SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

The Order requires:

The District shall prepare and implement a CIP that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

- (a) **Evaluation:** Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from the SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;*
- (b) **Design Criteria:** Where design criteria do not exist or are deficient, under take the evaluation identified in (a) above to establish appropriate design criteria; and*
- (c) **Capacity Enhancement Measures:** The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.*
- (d) **Schedule:** The enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (A)-(C) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D.14.*

9-1 COMPLIANCE

The SECAP was initially developed in 2005. A hydraulic model of the District's sewer system was developed utilizing the information contained in the District's wastewater collection system GIS, "As constructed" plans, and field surveying.

The District updated its SECAP in July 2006, November 2007, April 2009, and April 2012. As part of this SSMP report, the District has updated its hydraulic model to include all completed improvement projects. All updates since the previous 2012 SECAP was completed are detailed within this report.

A. EVALUATION

Order 2006-03-DWQ requires the SECAP to include *"Evaluation: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from the SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;*

The System Evaluation and Capacity Assurance Plan (SECAP) document was developed and is kept up-to-date using a calibrated hydraulic model of the District’s sewer system.

Model Geometry

All pipes are included in the model except for laterals and private sewer lines. Pipe diameters, lengths, slopes, and roughness coefficients are entered in the model. “As Constructed” plans were used to update the existing model geometry.

Unit Flow Factors

Initially, the system-wide unit flow factors developed for the District’s 2001 Sewer Master Plan were used to estimate the average dry weather flows. They were then refined with the extensive flow monitoring data developed by the District staff. The existing development unit flow factors used in the current hydraulic model are illustrated in Table 9-1. For future developments with detailed planning information, the factors provided in Table 9-2 were implemented.

**Table 9-1
Unit Wastewater Flow Factors**

Land Use Designation	Land Uses	Unit Flow Factor	Units
R-1	Low Density Residential	1,450	GPD/AC
R-2	Medium Density Residential	2,750	GPD/AC
R-3	High Density Residential	3,000	GPD/AC
C-1	Neighborhood Commercial	1,500	GPD/AC
C-2	Community Commercial	1,500	GPD/AC
M-1	Light Industrial	2,000	GPD/AC
O-P	Office/Professional	1,500	GPD/AC
O-S	Open Space	10	GPD/AC
PUD	Planned Unit Development	1,000	GPD/AC
BCSP, CCSP, HCSP	Specific Plans	1,000	GPD/AC

**Table 9-2
Unit Wastewater Flow Factors – Future Developments**

Land Uses	Unit Flow Factor	Units
Low Density Residential	300	GPD/DU
Medium Density Residential	275	GPD/DU
High Density Residential	225	GPD/DU
General Commercial or Retail	125	GPD/TSF
Office	100	GPD/TSF
Hotel	150	GPD/Room
Restaurant	1,000	GPD/TSF
Medical Facility	1,000	GPD/TSF

Neighboring Agencies

Wastewater flows from several neighboring jurisdictional agency territories enter the Garden Grove Sanitary District's collection system. The average dry weather flows for these agencies were estimated based upon the tributary area land uses and the unit flow factors listed in Table 9-1, and input into the model.

Future Developments

Since the District's service area is mostly developed, the hydraulic analyses were conducted utilizing fully developed and occupied tributary areas with peak dry weather flows. This included future flows from identified projects, which will increase the wastewater flows above the levels estimated by the unit flow factors. Future Development loads are included in Table 9-3.

Peaking Dry Weather Flow Factor

Peak dry weather flow is calculated from average dry weather flow utilizing the following formula:

$$\begin{aligned} Q_{pdw} &= 2.0 \times Q_{adw}^{0.92} \text{ (cfs) or} \\ Q_{pdw} &= 1.9313 \times Q_{adw}^{0.92} \text{ (mgd)} \\ Q_{adw} &= \text{average dry weather flow} \\ Q_{pdw} &= \text{peak dry weather flow} \end{aligned}$$

This formula was developed from an extensive flow monitoring effort throughout the District's service area. It may be modified in the future for specific large single land use areas, such as resort hotels and industrial, based upon additional flow monitoring results.

Peak Wet Weather Flow Factor

Peak wet weather flow (Q_{pww}) is calculated from peak dry weather flow utilizing the following formula:

$$Q_{pww} = 1.4 \times Q_{pdw}$$

This relationship was developed from the data collected in 2003 during the preparation of Garden Grove Sanitary District's Inflow and Infiltration Reduction Plan.

B. DESIGN CRITERIA

Order 2006-0003-DWQ requires that the SECAP include "Design Criteria: where design criteria do not exist or are deficient, under take the evaluation identified in (a) above to establish appropriate design criteria."

The District maintains design criteria in the Garden Grove Sanitary District Design Criteria and Standards for Sewer Facilities document which meet the requirements of Order 2006-0003-DWQ. The standards can be found on the City of Garden Grove's website listed below and at the Municipal Service Center.

<https://ggcity.org/pdf/pw/landdev/Sewer%20Standard%20Specs.pdf>

**Table 9-3
Future Developments**

Area	Location	Land Use	No. Units	Unit Type	Area (ac)	Density (du/ac)	Unit Flow Factor (gpd/unit)	Total Ave Load (gpd)
1	Construction Completed							
2	Eliminated							
3	SE corner of Chapman Ave and Brookhurst St	High Density Residential	250	DU	8.3	30.1	225	56,250
4	NW corner of Brookhurst and Garden Grove Blvd (Brookhurst Traingle)	High Density Residential	550-750	DU	16.6	33-45	225	168,750
		General Commercial/Retail	200	TSF			125	25,000
Subtotal for Area 4								193,750
5	Eliminated							
6	Eliminated							
7	Construction Completed							
8	Eliminated							
9	South of Garden Grove Blvd at West St (Olson II)	Low Density Residential	10-30	DU	0.4	25-75	300	9,000
10	NE corner of Garden Grove Blvd and West St	High Density Residential	200	DU	2.3	86.2	225	45,000
11	Eliminated							
12	Construction Completed							
13	Construction Completed							
14	Northwest corner of Harbor Blvd and Twintree Ln	Hotel	800	Rooms	3.9		150	120,000
		Restaurant	10	TSF			1,000	10,000
		Indoor/Outdoor Water Park ¹	100	TSF				10,600
Subtotal for Area 14								140,600
15	North of Chapman Ave and west of Harbor Blvd (Langsdon Pit)	Hotel	238	Rooms	9.4		150	35,700
		Restaurant	5	TSF			1,000	5,000
Subtotal for Area 15								40,700
16	Northeast corner of Harbor Blvd and Twintree Ln	Hotel	700	Rooms	5.2		150	105,000
		Restaurant	15	TSF			1,000	15,000
Subtotal for Area 16								120,000
17	Construction Completed							
18	Eliminated							
19	Eliminated							
20	Eliminated							
21	Construction Completed							
22	Construction Completed							
23	Construction Completed							
24	Construction Completed							
25	SE corner of Adelle St and Stanford Ave	Low Density Residential	12	DU	0.8	15.5	300	3,600
26	Construction Completed							
27	Construction Completed							
28	Construction Completed							

**Table 9-3 (Continued)
Future Developments**

Area	Location	Land Use	No. Units	Unit Type	Area (ac)	Density (du/ac)	Unit Flow Factor (gpd/unit)	Total Ave Load (gpd)
29	South side of Garden Grove Blvd, west of Brookhurst St (Galleria Project)	High Density Residential	400	DU	2.2	184.0	225	90,000
		General Commercial/Retail	17	TSF			125	2,125
Subtotal for Area 29								92,125
30	8218-8242 Garden Grove Blvd	High Density Residential	46	DU	1.51	30.5	225	10,350
31	Construction Completed							
32	Construction Completed							
33	SW Corner of Chapman Ave and Brookhurst St	Restaurant	11	TSF	25.9		1000	11,000
34	North side of Garden Grove Blvd, east of Galway St	General Commercial/Retail	30	TSF	1.0		125	3,750
35	South side of Garden Grove Blvd at Village Rd	General Commercial/Retail	60	TSF	3.1		125	7,500
36	West side of Nelson St, north of Stanford Ave	Low Density Residential	12	DU	1.3	9.4	300	3,600
37	SW corner of Garden Grove Blvd and Euclid St	General Commercial/Retail	15	TSF	0.5		125	1,875
38	North side of Hazard Ave, west of Euclid St	High Density Residential	90	DU	6.0	15.0	225	20,250
39	Between Harbor Blvd and Buaro St	General Commercial/Retail	12	TSF	0.6		125	1,500
40	Southwest corner of Harbor Blvd and Twintree Ln	Hotel	400	Rooms	3.74		150	60,000
41	South side of Garden Grove Blvd, east of Euclid St, at 11222 Garden Grove Boulevard	High Density Residential	16	DU	0.65	24.6	225	5,538
42	West side of Buaro St, south of Chapman Ave, at 12111 Buaro Street	Medium Density Residential	17	DU	1	17.0	275	4,675
43	Northwest corner of Lewis St and Garden Grove Blvd, at 12901 Lewis Street.	Low Density Residential	70	DU	9	7.8	300	2,333
44	9861 11th Street, Garden Grove,	Medium Density Residential	31	DU	1.76	17.6	275	4,844
45	9841 11th Street, Garden Grove	Medium Density Residential	10	DU	0.44	22.7	275	6,250

¹ It is estimated that a maximum of 10,000 gpd of the carry off will enter the sewer system. Each filtration system will use 600 gpd per backwash and the backwash of the systems will be time staggered to flush only one of the systems per day. The indoor/outdoor water park load is not peaked in the model.

Existing Collection System

The existing collection system pipes are considered capacity deficient when the calculated peak dry weather depth to diameter ratio is above 0.62. The capacity available between depth to diameter ratios of 0.62 and 0.82 is reserved for wet weather flows.

New Collection System Pipes

All collection system pipes 15 inches in diameter and smaller will be designed to flow at or below a depth to diameter ratio of 0.50 with peak dry weather flows. The capacity available between depth to diameter ratios of 0.50 and 0.82 is reserved for wet weather flows.

New pipes 18 inches in diameter and larger will be designed to flow at or below a depth to diameter ratio of 0.62. The capacity available between depth to diameter ratios of 0.62 and 0.82 is reserved for wet weather flows.

Where possible, a minimum velocity of 2.0 feet per second will be provided with average dry weather flows.

C. CAPACITY ENHANCEMENT MEASURES

Order 2006-0003-DWQ requires that the SECAP include “Capacity Enhancement Measures: The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.”

Model Results

The capacity deficiencies identified through hydraulic analysis are illustrated on Figure 9-1. Summary of the results for the model calculated capacity deficient reaches is provided in Table 9-4.

Deficiency Verification

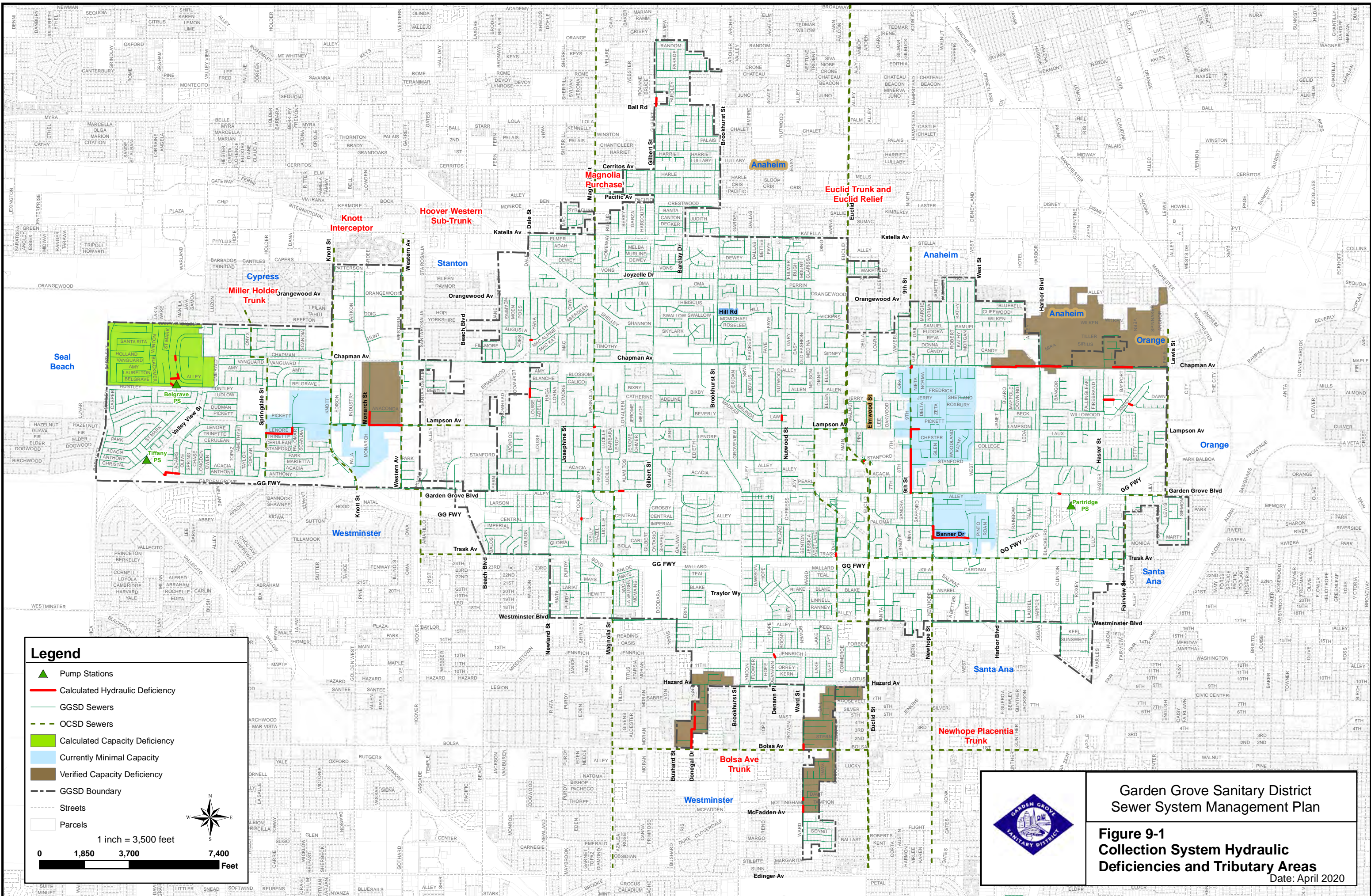
Most of the sewers identified as deficient by the model were flow monitored to determine the level of deficiency since the model average and peak dry weather flows are typically higher than the actual flows.

Based on the flow monitoring results, the sewers identified as deficient per the hydraulic model were categorized into three categories: verified deficiency (PDWF d/D >0.62), minimal capacity (PDWF d/D between 0.50 and 0.62), calculated deficiency (PDWF d/D <0.50). The associated tributary areas are colored accordingly in Figure 9-1. The category for the associated recommended improvement project is noted in Table 9-5, Recommended Capacity Improvement Projects, under the “Comments” column.

The sewers categorized as “calculated deficiency” are possible future deficiencies, and will be monitored as new development that may increase the wastewater flows are proposed within their tributary areas. Additionally, some of the sewers will be flow monitored again following the implementation of the diversion projects in order to verify the adequacy of the relief provided.

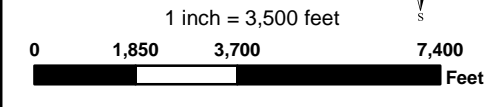
Capital Improvement Program

The Capital Improvement Program for capacity improvements is formulated to eliminate the deficiencies in accordance with Garden Grove Sanitary District’s criteria. It consists of replacement with larger pipes, diversions to adjacent or nearby Orange County Sanitation District facilities, diversions to Garden Grove Sanitary District facilities with adequate capacity, or combinations of these.



Legend

- ▲ Pump Stations
- Calculated Hydraulic Deficiency
- GGSD Sewers
- OCSD Sewers
- Calculated Capacity Deficiency
- Currently Minimal Capacity
- Verified Capacity Deficiency
- GGSD Boundary
- Streets
- Parcels



**Garden Grove Sanitary District
Sewer System Management Plan**

**Figure 9-1
Collection System Hydraulic
Deficiencies and Tributary Areas**
Date: April 2020

**Table 9-4
Pipes with Model Calculated Capacity Deficiencies**

Pipe ID	U/S MH	D/S MH	Dia (in)	Length (ft)	Slope	PDWF (mgd)	ADWF (mgd)	PDWF Vel (ft/s)	PDWF d/D	PDWF Depth (ft)	Full Flow (mgd)
159	7316	7318	8	262	0.0020	0.3503	0.1563	1.55	1.00	0.67	0.3491
222	6929	6932	8	262	0.0028	0.3122	0.1379	2.01	0.65	0.43	0.4133
225	6932	6933	8	130	0.0021	0.3722	0.1670	1.65	1.00	0.67	0.3569
226	6933	6934	8	380	0.0020	0.3890	0.1752	1.72	1.00	0.67	0.3502
227	6934	6935	8	90	0.0020	0.4203	0.1906	1.86	1.00	0.67	0.3502
228	6935	6936	8	300	0.0022	0.4922	0.2263	2.18	1.00	0.67	0.3701
230	6938	6929	8	266	0.0016	0.3008	0.1325	1.59	0.78	0.52	0.3148
391	7301	7302	8	200	0.0026	0.3203	0.1419	1.97	0.68	0.45	0.3993
401	7312	7313	8	194	0.0014	0.3385	0.1507	1.50	1.00	0.67	0.2918
890	8104	8098	8	540	0.0022	0.3619	0.1620	1.85	0.81	0.54	0.3661
1132	7729	7732	8	258	0.0020	0.2780	0.1216	1.73	0.67	0.45	0.3516
1133	7731	7730	8	362	0.0020	0.2878	0.1263	1.73	0.69	0.46	0.3494
1134	7732	7731	8	362	0.0020	0.2818	0.1234	1.72	0.68	0.45	0.3494
1202	7384	7386	8	253	0.0026	0.3344	0.1487	2.00	0.70	0.46	0.4030
1306	7730	7405	8	367	0.0020	0.2953	0.1299	1.74	0.71	0.47	0.3494
1393	7780	8652	8	325	0.0020	0.3431	0.1529	1.77	0.80	0.53	0.3502
1770	8098	8099	12	660	0.0015	0.6420	0.3021	1.92	0.63	0.63	0.8942
1772	8099	7189	12	660	0.0011	0.6820	0.3225	1.68	0.75	0.75	0.7519
1815	8695	8696	8	250	0.0016	0.2538	0.1101	1.55	0.68	0.46	0.3132
1816	8696	8697	8	167	0.0016	0.2538	0.1101	1.55	0.68	0.45	0.3149
1817	8697	8698	8	299	0.0024	0.3390	0.1509	1.92	0.73	0.49	0.3843
1821	8701	8702	8	360	0.0020	0.5148	0.2376	2.28	1.00	0.67	0.3502
1822	8702	8703	8	361	0.0020	0.5148	0.2376	2.28	1.00	0.67	0.3499
1823	8698	8701	8	338	0.0021	0.3917	0.1766	1.74	1.00	0.67	0.3614
2097	8918	BELGRAVE1	12	90	0.0004	0.8337	0.4013	1.64	1.00	1.00	0.4867
2098	8653	8918	12	200	0.0012	0.8309	0.3998	1.64	1.00	1.00	0.8114
2564	11229	11231	8	69	0.0019	0.2637	0.1148	1.67	0.66	0.44	0.3406
2788	11612	11613	8	250	0.0020	0.3009	0.1325	1.75	0.71	0.48	0.3502
2789	11613	11614	8	296	0.0020	0.3068	0.1354	1.75	0.73	0.48	0.3496
2790	11614	11615	8	226	0.0020	0.3068	0.1354	1.75	0.73	0.48	0.3494
2791	11615	11611	8	241	0.0020	0.3096	0.1367	1.77	0.73	0.48	0.3531
3374	8400	8402	8	317	0.0017	0.2606	0.1134	1.59	0.68	0.45	0.3232
3706	10895	11440	8	345	0.0020	0.3368	0.1498	1.76	0.79	0.53	0.3477
3848	11440	10866	8	340	0.0020	0.3428	0.1527	1.77	0.80	0.53	0.3502
4360	10893	10894	8	260	0.0020	0.3236	0.1434	1.76	0.76	0.51	0.3502
4361	10894	10895	8	240	0.0021	0.3288	0.1460	1.80	0.76	0.50	0.3574
4804	10866	10867	8	330	0.0022	0.3434	0.1530	1.83	0.77	0.52	0.3632
4805	10867	13176	8	175	0.0030	0.3737	0.1678	2.15	0.72	0.48	0.4309
5624	13176	13175	8	12	0.0100	0.5934	0.2773	3.82	0.65	0.43	0.7831
6028	12252	12253	10	155	0.0011	0.5010	0.2307	1.42	1.00	0.83	0.4702

**Table 9-4 (Continued)
Pipes with Model Calculated Capacity Deficiencies**

Pipe ID	U/S MH	D/S MH	Dia (in)	Length (ft)	Slope	PDWF (mgd)	ADWF (mgd)	PDWF Vel (ft/s)	PDWF d/D	PDWF Depth (ft)	Full Flow (mgd)
6029	12253	12254	10	240	0.0011	0.5023	0.2314	1.43	1.00	0.83	0.4762
6050	12526	12533	8	360	0.0021	0.2609	0.1135	1.72	0.64	0.42	0.3549
6154	13023	13054	12	225	0.0022	1.2801	0.6395	2.52	1.00	1.00	1.0884
6219	13025	13026	12	180	0.0020	0.7997	0.3835	2.25	0.66	0.66	1.0325
6220	13026	13027	12	300	0.0022	0.8201	0.3941	2.35	0.65	0.65	1.0829
6221	13028	13023	12	30	0.0017	0.8333	0.4010	2.10	0.73	0.73	0.9426
6225	13031	13032	15	268	0.0017	1.3219	0.6623	2.39	0.66	0.82	1.7160
6226	13050	13051	12	320	0.0022	1.2943	0.6473	2.55	1.00	1.00	1.0798
6227	13051	13052	12	320	0.0022	1.3082	0.6548	2.58	1.00	1.00	1.0798
6230	13054	13050	12	150	0.0023	1.2801	0.6395	2.52	1.00	1.00	1.0992
6276	13032	13057	15	353	0.0019	1.3219	0.6623	2.51	0.63	0.79	1.8235
6541	12476	12477	10	258	0.0043	0.7896	0.3783	2.98	0.70	0.59	0.9355
6542	12477	12478	10	260	0.0044	0.8014	0.3844	3.01	0.71	0.59	0.9443
6543	12478	12479	10	316	0.0042	0.8044	0.3859	2.95	0.72	0.60	0.9246
6544	12479	12480	10	348	0.0039	0.8103	0.3890	2.84	0.76	0.63	0.8816
6545	12533	12534	10	325	0.0013	0.4188	0.1899	1.60	0.70	0.58	0.5043
6560	13027	13028	12	325	0.0018	0.8333	0.4010	2.14	0.72	0.72	0.9669
6579	12536	12537	10	165	0.0040	0.7677	0.3668	2.86	0.71	0.59	0.8980
6580	12537	12476	10	472	0.0042	0.7766	0.3715	2.94	0.70	0.58	0.9242

In prioritizing the capacity improvement projects, the highest ranking was given to the verified deficiencies with the larger tributary areas and flows. Pipes with calculated deficiencies from the hydraulic model but flow monitoring depth to diameter ratios lower than 0.62 were ranked based upon the flow monitoring depth to diameter ratios. When the depth to diameter ratios were the same, the pipes with the larger flows were ranked higher. These pipes will be monitored in the future as additional development proposals are made in their tributary areas. When the actual peak dry weather depth to diameter ratio exceed the District criteria, these improvements will be implemented.

Sometimes when segments of sewers with lower priorities are located in the same vicinity as a higher priority project, an exception is made to include these lower priority sewers in that project to provide a more economically feasible Capital Improvement Program.

The recommended capacity improvement projects are included in Appendix G-1. Table 9-5 provides a prioritized listing of the recommended projects, as well as their implementation costs. The cost estimates provided in Table 9-5 are based upon 2019 dollars (average Engineering News Record Index of 12050.39 for the Los Angeles Area). Implementation cost is determined by adding 35 percent of construction cost to cover engineering, inspection, and administration. Future costs will have to be adjusted based upon changes in the engineering and construction costs. The total cost of the remaining capacity improvement projects is \$12.5M (\$10.2M for Future projects and \$2.3M for In Design Projects).

The collection system capacity improvement projects recommended are based upon the best information currently available. Detailed studies will be necessary to formulate the precise scope of each project.

Budget

The District's Sewer CIP budget is set at: approximately \$5 million annually. The rate ordinance has built in escalation for annual adjustments for increases in construction costs. The District maintains a CIP for both the system capacity improvements and rehabilitation and replacement projects.

The District implements the capacity improvement projects at approximately \$4 million per year, and the rehabilitation/replacement projects at approximately \$1 million per year. Once the system capacity improvements have been completed, the District will implement rehabilitation and replacement projects at approximately \$5 million per year."

Project Descriptions

The following includes brief descriptions of the recommended capacity improvement projects, along with an implementation schedule and estimated costs based upon planning level information available at the present. It is pointed out again that the estimated costs are based on 2019 dollars reflecting Engineering News Record Index for the Los Angeles Area (ENRLA) of 12057.54. Future budgeting will have to consider increases in construction costs.

Each project will have to be re-evaluated during the design stage for determining the appropriate sizes based upon detailed utility investigations. The Garden Grove Sanitary District will review the proposed schedule annually, and revise it as necessary based upon the more detailed information available to provide the most efficient service to its customers.

Priority No. 1 (Project No. 1) Garden Grove Boulevard, Coast Street and Trask Avenue

Project No. 1 was completed in Fiscal Year 2006-2007. The project started at Fern Street and Garden Grove Boulevard; extended west to Coast Street, south to Trask Avenue, and west to Beach Boulevard where it terminated at the Orange County Sanitation District's 15-inch Trask Branch of the Hoover-Western Sub-Trunk.

The depths of flow in the sewers involved were previously determined to exceed the District's criterion. The project included replacement of existing sewers and construction of 488 feet of 12-inch diameter sewer in Garden Grove Boulevard between Fern Street and Coast Street, 830 feet of 15-inch diameter sewer in Coast Street north of Garden Grove Freeway, and 1928 feet of 18-inch diameter sewers in the rest of Coast Street and in Trask Avenue.

Some of the flow tributary to this project is from the City of Stanton territories at Sycamore Street and Garden Grove Boulevard. The City of Stanton paid its fair share in the new facility based upon the ratio of average flow contributed by each agency. The total cost of the project was \$2.29 Million.

Priority No. 2 (Project No. 2) Brookhurst Street and Garden Grove Boulevard

Project No. 2 was completed in Fiscal Year 2006-2007. The project started at Brookhurst Street and Stanford Avenue; extended south to Garden Grove Boulevard, and east to Century Boulevard, where it terminated at Orange County Sanitation District's 54-inch Euclid Relief Trunk Sewer.

Project No. 2 diverts all the wastewater flow south at Brookhurst Street and Stanford Avenue, and intercepts the flows from the area north of Garden Grove Boulevard between Brookhurst Street and Century Boulevard. It eliminated the previously identified capacity deficiencies in:

- Garden Grove Boulevard between Nutwood Street and Galway Street
- Cypress Street south of Imperial Avenue
- Flower Street between Garden Grove Boulevard and Trask Avenue
- Galway Street between Garden Grove Boulevard and Central Avenue
- Stanford Avenue between Brookhurst Street and Brookhurst Way
- Brookhurst Way between Stanford Avenue and Garden Grove Boulevard
- Trask Avenue between Flower Street and Gilbert Street

It also provided capacity for the following proposed development projects:

- Brookhurst Triangle Development north of Garden Grove Boulevard and west of Brookhurst Street
- Meredith Development south of Garden Grove Boulevard and west of Brookhurst Street

This project included 602 feet of 15-inch sewer and 936 feet of 18-inch sewer in Brookhurst Street, 1640 feet of 18-inch sewer in Garden Grove Boulevard between Brookhurst Street and Nutwood Street, and 1403 feet of 21-inch sewer between Nutwood Street and Century Boulevard.

The total cost of the project was \$4.89 Million.

Table 9-5
Recommended Capacity Improvement Projects

Priority No.	Project No.	Location	Description	U/S MH	D/S MH	Existing Size (in)	Proposed Size (in)	Length (ft)	Estimated Construction Cost (\$) 2019	Total Cost (Cons, Engin, Inspect, &Admin) (\$)	Comments	Completed Project Cost (\$)	Plan No.	Year Scheduled for Construction
1	1	Garden Grove Boulevard	Fern Street to Coast Street	7719	7104	8	12	488	-		Cost includes Project No. 4	2,290,000	W-485	2007
			Garden Grove Boulevard to north of Route 22	7104	7107	10	15	830	-					
		Coast Street	North of Route 22 to Trask Avenue	7107	7115	10	18	1,796	-					
		Trask Avenue	Coast Street to Beach Boulevard	7115	7121	10	18	132	-					
2	2	Brookhurst Street	Stanford Avenue to south of Stanford Avenue	13323	11371	-	15	602	-			4,890,000	W-486	2007
		Brookhurst Street	South of Stanford Avenue to Garden Grove Boulevard	11371	11342	-	18	936	-					
		Garden Grove Boulevard	Brookhurst Street to Nutwood Street	11342	11379	-	18	1,640	-					
		Garden Grove Boulevard	Nutwood Street to Century Boulevard	11379	11623	-	21	1,403	-					
3	4	Newland Street	Gloria Avenue to Trask Avenue	7665	8608	8	12	246	-		Cost included in Project No. 1	See Project No. 1	W-485	2007
4	77	Joyzelle Street	Gilbert Street to Magnolia Avenue	10108	10387	8	15	2,487	-			1,030,000	W-492	2007
5	5	Chapman Avenue	Nearing Drive to Beach Boulevard	13526	8363	10	18	1,590	-			606,000	W-500	2008
		Nearing Drive	Augusta Drive to Fillmore Street	8540	13572	8	15	686	-					
		Nearing Drive	Fillmore Street to Chapman Avenue	13572	13526	8	15	489	-					
6	14	Augusta Drive	Dale Street to Nearing Drive	13585	8540	8	12	1,165	-			415,000	W-500	2008
7	15	Chapman Avenue	Dale Street to Nearing Drive	8520	13526	8	12	985	-			869,000	W-500	2008
8	7	Volkwood Street	Twintree Lane to Lampson Avenue	13807	13806	8	15	822	-			2,532,000	W-505	2008
		Volkwood Street	Lampson Avenue to Aspenwood Avenue	13806	13805	8	18	1,454	-					
		Aspenwood Avenue	Volkwood Street to Harbor Boulevard	13805	13753	8-10	18	1,132	-					
		Palm Street	Aspenwood Avenue to Garden Grove Boulevard	13753	13721	-	21	1,126	-					
		Garden Grove Boulevard	Palm Street to east of Harbor Boulevard	13721	13668	-	21	1,379	-					
9	9	Garden Grove Boulevard	East of Harbor Boulevard to West Street	13668	12897	10	24	1,184	-			845,000	W-505	2008
10	6	Gilbert Street	North of Shannon Avenue to Chapman Avenue	10090	13884	10	15	1,737	-			665,000	W-506	2009
11	101	Tiffany Pump Station	1560 gpm firm capacity						-			2,493,000	W-512	2010
12	8	Buaro Street	Hoggan Avenue to Lampson Avenue	14370	12147	10	12	274	-			686,800	W-517	2009
		Buaro Street	Lampson Avenue to Harbor Boulevard	12147	14361	10	15	2,320	-					
13	102	Belgrave Pump Station	1560 gpm firm capacity						-			2,469,056	W-538	2013
14	3	Garden Grove Boulevard	East of Village Center Drive	7140	7142	8	12	373	-			272,100	Stanton (S-1001-L thru S-1007-L)	2009
		Garden Grove Boulevard	Village Center Drive to Hoover Street	7142	7174	8	15	1,115	-					

Table 9-5 (Continued)
Recommended Capacity Improvement Projects

Priority No.	Project No.	Location	Description	U/S MH	D/S MH	Existing Size (in)	Proposed Size (in)	Length (ft)	Estimated Construction Cost (\$) 2019	Total Cost (Cons, Engin, Inspect, &Admin) (\$)	Comments	Completed Project Cost (\$)	Plan No.	Year Scheduled for Construction
15	20	Lampson Avenue	Haster Street to Volkwood Street	12643	13806	8	15	1,453	-					
16	21	Lampson Avenue	Easement to Haster Street	12627	12643	8	15	1,350	-			1,471,623	W-533	2012
17	10	Lampson Avenue at Euclid Street	Divert to Euclid Trunk Sewer (OCSD)	12790	-	-	-	-	-			27,800	Sewer Diversion	2007
18	11	Trask Avenue west of Clinton Street	Divert to Newhope Placentia Trunk (OCSD) east of East Garden Grove Wintersburg Channel	6754	-	-	-	-	-			154,600	W-529	2010
19	12	Brookhurst Street	Hill Road to Chapman Avenue	14748	14744	10	18	1,952	-			1,702,600	W-525	2010
20	13	Brookhurst Street	Parliament Ave to Hill Road (includes double barrel 10" & 12" siphon under Anaheim Barber Channel)	14762	14748	10	15	1,463	-		Cost included in Project No. 12	See Project No. 12	W-525	2010
21	16	Parliament Avenue	Palmwood Drive to Dallas Drive	9832	14803	8	12	1,096	-		Cost included in Project No. 12	See Project No. 12	W-525	2010
22	17	Parliament Avenue	Dallas Drive to Brookhurst Street	14803	14762	8	12	1,603	-		Cost included in Project No. 12	See Project No. 12	W-525	2010
23	19	Galway Street	Central Avenue to Trask Avenue	12052	14517	12	18	1,358	-			1,478,900	W-516 & W508	2009
		Garden Grove Boulevard	Brookhurst Way to Galway Street	11337	14483	8	12	1,449	-					
		Garden Grove Boulevard	East of Brookhurst Way	11335	11337	8	10	297	-					
24	22	Easement	Twintree Circle to Lampson Avenue	12625	12627	8	New Alignment and diversion.	730	-			See Projects 20 & 21	W-533	2012
25	23	Twintree Circle	East of Anzio Circle	12647	12625	8	New Alignment and diversion.	495	-					
26	24	Twintree Lane	Haster Street to Volkwood Street	12644	13807	8	15	1,463	-			970,000	W-537	2012
27	25	Haster Street	Allard Avenue to Twintree Lane	12656	12644	8	10	500	-					
28	26	Haster Street	Blue Spruce Avenue to Garden Grove Boulevard	12427	13228	8	12	1,426	-					
29	27	Cerritos Avenue	Brookhurst Street to Perdido Street (89% Anaheim)	9144	9215	8	15	1,185	-			633,855	Anaheim Plan No. 2991	2014
30	28	Cerritos Avenue	Perdido Street to Gilbert Street (89% Anaheim)	9215	9343	8	15	1,464	-					
31	32	Lampson Avenue	Walnut Street to Euclid Street	11766	11768	8	12	405	-			963,782	W-542	2013
		Euclid Street	Lampson Avenue to OCSD Euclid Trunk Sewer	11768	12790	8	12	518	-					
32	35	Trask Avenue	Gilbert Street to Magnolia Street	11525	11594	18	21	1,473	-		Cost included in Project No. 19	See Project No. 19	W-516	2009

Table 9-5 (Continued)
Recommended Capacity Improvement Projects

Priority No.	Project No.	Location	Description	U/S MH	D/S MH	Existing Size (in)	Proposed Size (in)	Length (ft)	Estimated Construction Cost (\$) 2019	Total Cost (Cons, Engin, Inspect, &Admin) (\$)	Comments	Completed Project Cost (\$)	Plan No.	Year Scheduled for Construction
33	45	Gilbert Street	Crosby Avenue to Trask Avenue	12087	11525	8	12	1,824	-		Cost included in Project No. 19	See Project No. 19	W-516	2009
34	90	Newland Street	North of Westminster Avenue	14541	14544	8	Parallel 8"	190	-			23,800	A-1790	2010
35	56	Yockey Street	Divert flow to the parallel line-same elevation	11607	11612	-	8	133	-			61,100	Yockey Sewer Improvements	2008
36	80	Stanford Avenue at Nelson	Divert flow to OCSD in Nelson	13424	-	-	-	-	-			215,700	W-510	2008
37	57	Grove Street	Acacia Avenue to Garden Grove Boulevard	11842	12260	8	12	648	-			350,000	W-509	2008
38	60	Elmwood Street	Jerry Lane to Lampson Avenue	12316	11763	6	8	1,155	-			See Project 32	W-542	2013
		Lampson Avenue	Elmwood Street to Walnut Avenue	11763	11766	8	12	740	-					
39	61	Garden Grove Boulevard	East of Palm Street	12457	13721	10	15	212	-		Cost included in Project No. 7	See Project No. 7	W-505	2008
40	70	Chapman Avenue	Loraleen Street to Magnolia Street	13877	10846	18	24	1,307	-			953,000	W-506	2008
		Chapman Avenue	West of Magnolia Street	10325	10846	8	10	256	-					
41	71	Chapman Avenue	Gilbert Street to Loraleen Street	13884	13877	18	24	1,079	-			853,000	W-506	2008
42	72	Chapman Avenue	East of Gilbert Street	10043	10047	10	15	385	-			2,496,000	W-541	2013
		Chapman Avenue	Brookhurst Street to east of Gilbert Street	14744	10047	15	18	1,913	-					
		Chapman Avenue	East of Gilbert Street to Gilbert Street	10047	13884	15	24	753	-					
53	54	Lampson Avenue	Brookhurst Street to Spruce Street	9445	9481	8	12	565	-		Verified Deficiency	2,129,000	W-555	2014
54	55	Brookhurst Street	Bonser Avenue to Lampson Avenue	9456	9445	8	12	1,355	-		Minimal Capacity			
55	74	Lampson Avenue	Spruce Street to Gilbert Street	9481	9521	10	12	2,023	-		Minimal Capacity			
56	36	Lampson Avenue	Gilbert Street to Leroy Avenue	9521	9111	12	18	1,325	-		Minimal Capacity			
57	64	Joyzelle Street	Barkley Drive to Gilbert Street	10100	10108	8	10	1,255	-		Verified Deficiency	657,854	W-560	2015
81	82	Hill Road	Garden Drive to Brookhurst Street	10203	14748	8	10	774	-		Calculated Deficiency	See Project 64	W-560	2015
72	33	Westminster Avenue	Roxey Drive to Clinton Street	7482	7508	10	15	689	-		Minimal Capacity		SS-089	2013
73	34	Westminster Avenue	Clinton Street to Harbor Boulevard	7508	7556	12	18	2,666	-		Minimal Capacity		SS-089	2013
47	59	Traylor Way	Dawson Street to Brookhurst Street	10507	11369	8	12	917	-		Verified Deficiency	768,000	W-552	2013
48	65	Hope Street	Morningside Drive to Westminster Channel	7264	7265	8	12	193	-		Verified Deficiency; Does not include siphon at Westminster Channel	See Project 59	W-552	2013
		Deanann Place	Jennrich Avenue to Hazard Avenue	7267	7558	8	12	1,134	-					

Table 9-5 (Continued)
Recommended Capacity Improvement Projects

Priority No.	Project No.	Location	Description	U/S MH	D/S MH	Existing Size (in)	Proposed Size (in)	Length (ft)	Estimated Construction Cost (\$) 2019	Total Cost (Cons, Engin, Inspect, &Admin) (\$)	Comments	Completed Project Cost (\$)	Plan No.	Year Scheduled for Construction
58	53	Nutwood Street	Molama Circle to Lampson Avenue	11229	11137	8	10	334	222,510	300,389	Verified Deficiency	1,269,000	W-568	2017
		Nutwood Street	Lampson Avenue to Stanford Avenue	11137	11120	8	12	1,327	1,060,854	1,432,153				
		Nutwood Street	Park Avenue to Garden Grove Boulevard	11122	13361	10	15	966	965,321	1,303,183				
74	44	Imperial Avenue	East of Magnolia Street to Magnolia Trunk (OCSD)	11545	11587	8	10	541	360,413	486,558	Minimal Capacity	See Project 53	W-568	2017
61	91	Trask Avenue	Jackson Street to Coast Street	7076	7115	10	15	525	524,631	708,252	Verified Deficiency	1,471,818	W-586	2017-2018
65	51	Stanford Avenue	Blackthorn Street to Brookhurst Street	11322	13323	8	12	914	730,686	986,426	Minimal Capacity	See Project 91	W-586	2017-2018
77	76	Josephine Street	Acacia to Garden Grove Boulevard	8393	9394	8	10	852	567,601	766,261	Minimal Capacity	See Project 91	W-586	2017-2018
75	63	Newland Street	Route 22 to Gloria Avenue	7660	7665	8	12	1,010	807,432	1,090,033	Minimal Capacity	See Project 91	W-586	2017-2018
45	68	Onyx Street	North of Chapman Avenue	7384	7386	8	10	253	168,548	227,540	Verified Deficiency	See Project 91	W-555	2017-2018
76	93	Westminster Avenue	Anita Place to Euclid Street	11967	11974	12	15	620	619,564	836,412	Minimal Capacity	753,000	W-585	2018-2019
51	99	Ward Street	Davit Avenue to McFadden Avenue	7312	7318	8	12	652	544,399	734,939	Verified Deficiency	719,809	W-581	2020
52	96	Ward Street	North of Bolsa Avenue	7301	7302	8	10	200	139,161	187,868	Verified Deficiency	see Project 99	W-581	2020
62	92	Donegal Drive	Madison Circle to Bolsa Avenue	6938	6937	8	12	1,478	1,234,083	1,666,012	Verified Deficiency			In Design
71	31	Lampson Avenue at 9th Street	Divert to South Anaheim Interceptor (OCSD)	12526	12533	8	10	360	486,647	656,973	Minimal Capacity			In Design
43	46	Monarch Street	Anaconda Avenue to Lampson Avenue	8104	8098	8	12	540	450,883	608,692	Verified Deficiency			2020-2025
44	75	Lampson Avenue	Monarch Street to Western Avenue	8098	7189	12	15	1,320	1,377,698	1,859,892	Minimal Capacity			2020-2025
46	43	Lamplighter Street	Killarney Avenue to Lenore Ave	7729	7732	8	12	258	206,255	278,444	Minimal Capacity			2020-2025
		Lenore Avenue	Lamplighter Street to Springdale Street	7732	7404	8	12	1,204	1,005,302	1,357,157				2020-2025
50	56A	Yockey Street	Reestablish 8" connection to easterly sewer and split flow	11607	14201	-	8	51	28,389	38,325	Verified Deficiency			2020-2025
59	79	Chapman Avenue	West of Harbor Boulevard (for Anaheim/Orange Flows)	13028	13052	12	18	1,045	1,308,813	1,766,897	Verified Deficiency, Anaheim / Orange Funded			2020-2025
60	67	Chapman Avenue	East of Harbor Boulevard (80% Anaheim and Orange)	13025	13028	12	15	805	168,037	226,850	Minimal Capacity			2020-2025
63	47	Banner Drive	East of Newhope Street	10893	10866	8	12	1,185	989,437	1,335,740	Minimal Capacity			2020-2025
64	48	Newhope Street	Banner Drive to Paloma Avenue	10866	13175	8	12	517	413,309	557,968	Minimal Capacity			2020-2025
66	85	Chapman Avenue	East of Haster Street (for Orange flows)	12252	13004	10	12	763	637,081	860,059	Minimal Capacity, Orange Funded			2020-2025
78	37	Belgrave Avenue	St. Mark Street to Belgrave Pump Station	8653	8913	12	18	290	363,211	490,335	Calculated Deficiency			2020-2025
79	38	Laurelton Avenue	Bailey Street to St. Mark Street	7780	8652	8	12	325	259,817	350,753	Calculated Deficiency			2020-2025
80	39	Bailey Street	South of Chapman Avenue to Laurelton Avenue	8909	7780	8	12	442	369,056	498,226	Calculated Deficiency			2020-2025

Table 9-5 (Continued)
Recommended Capacity Improvement Projects

Priority No.	Project No.	Location	Description	U/S MH	D/S MH	Existing Size (in)	Proposed Size (in)	Length (ft)	Estimated Construction Cost (\$) 2019	Total Cost (Cons, Engin, Inspect, &Admin) (\$)	Comments	Completed Project Cost (\$)	Plan No.	Year Scheduled for Construction
Total Constructed								80,904		40,187,197				
Total in Design or Under Construction								2,690	2,404,290	2,322,985				
Total Future Projects								8,745	7,577,288	10,229,338				
Grand Total								92,339		52,739,520				

Priority No. 3 (Project No. 4) Newland Street Sewer, Gloria Avenue to Trask Avenue

The hydraulic model of the system showed this 246 foot section of 8-inch pipe to flow full with peak dry weather flows. It was replaced with a 12-inch pipe between Manholes 7665 and 8608.

Project No. 4 was completed in Fiscal Year 2006-2007. The design and construction was packaged in with Project No. 1. The total cost of the project was \$2.29M.

Priority No. 4 (Project No. 77) Joyzelle Street Sewer, Gilbert Street to Magnolia Avenue

Project No. 77 was completed in Fiscal Year 2006-2007. The system hydraulic model showed the 584 feet of 8-inch sewer between Manholes 10841 and 10843 (Homeway Drive to Magnolia Avenue) to flow at a depth to diameter ratio of 0.64 with peak dry weather flows.

The system hydraulic model also showed 2,245 feet of 10-inch sewer in Gilbert Street, between Orangewood Avenue and Chapman Avenue, to flow at a depth to diameter ratio of 0.63 to 1.00 with peak dry weather flows.

To alleviate the deficiency in Gilbert Street as well as to take care of the condition and capacity deficiencies in Joyzelle Street, the flow was diverted to the west at the intersection of Joyzelle Street and Gilbert Street at Manhole 10108. Approximately 2,487 feet of 15-inch pipe was constructed in Joyzelle Street from Gilbert Street (10108) to Magnolia Avenue (10387). The new sewer ties into the OCSD's existing Magnolia Purchase Trunk Sewer at the intersection of Joyzelle Street and Magnolia Avenue.

The total cost of the project was \$1.03 Million.

Priority No. 5 (Project No. 5) Chapman Avenue and Nearing Drive

The system hydraulic model determined that the 10-inch diameter sewer in Chapman Avenue from Nearing Drive to Beach Boulevard, and the 8-inch diameter sewer in Nearing Drive between Augusta Drive and Chapman Avenue would flow full with peak dry weather flows. Flow monitoring conducted in March 2005 confirmed this. The pipes were replaced with larger pipes as follows:

- 1590 feet of 10-inch sewer replaced with 18-inch sewer in Chapman Avenue between Nearing Drive and Beach Boulevard (13526 to 8363)
- 1175 feet of 8-inch sewer replaced with 15-inch sewer in Nearing Drive between Augusta Drive and Chapman Avenue (8540 to 13526)

Project No. 5 was completed in 2008. The cost of the project was \$606,000.

Priority No. 6 (Project No. 14) Augusta Drive, Dale Street to Nearing Drive

This is 1165 feet of 8-inch line extending from Manhole 13585 in Dale Street to Manhole 8540 in Nearing Drive. The system hydraulic model showed it to be flowing full with peak dry weather flows. It was replaced with a 12-inch line.

Project No. 14 was completed in 2008. The cost of the project was \$415,000

Priority No. 7 (Project No. 15) Chapman Avenue, Dale Street to Nearing Drive

Project No. 15 replaced 985 feet of 8-inch line between Manhole 8520 at Dale Street and Chapman Avenue and Manhole 13526 at Nearing Drive and Chapman Avenue with a 12-inch line. The system hydraulic model previously showed this reach to have peak dry weather flow depth to diameter ratios of 0.74 to 1.00.

Project No. 15 was completed in 2008. The cost of the project cost was \$869,000

Priority No. 8 (Project No. 7) Volkwood Street, Aspenwood Avenue, Palm Street, and Garden Grove Boulevard

The purpose of this project was to provide relief to the sewers in:

- Lampson Avenue between Volkwood Street and Buaro Street
- Twintree Lane between Volkwood Street and Harbor Boulevard
- Harbor Boulevard between Twintree Lane and Lampson Avenue
- Blue Spruce Avenue between Volkwood Street and Choisser Road
- Choisser Road between Blue Spruce Avenue and Aspenwood Avenue
- Easement between Harbor Boulevard and Buaro Street

All these lines were previously identified by the system hydraulic model to be capacity deficient.

This project consisted of:

- 822 feet of 15-inch pipe in Volkwood Street between Twintree Lane (13807) and Lampson Avenue (13806), diverting all the flow south in Volkwood Street
- 1454 feet of 18-inch sewer in Volkwood Street between Lampson Avenue (13806) and Aspenwood Avenue (13805), diverting all the flow south in Volkwood Street
- 1132 feet of 18-inch sewer in Aspenwood Avenue between Volkwood Street (13805) and Harbor Boulevard (13753)
- 1126 feet of 21-inch sewer in Palm Street between Aspenwood Avenue (13753) and Garden Grove Boulevard (13721)
- 1379 feet of 21-inch sewer in Garden Grove Boulevard between Palm Street (13721) and Harbor Boulevard (13668)

The 21-inch pipe ties into the 24-inch sewer of Project No. 9 at the intersection of Garden Grove Boulevard and Harbor Boulevard. The flow is conveyed to the west and discharges into OCSD's South Anaheim Interceptor at the intersection of Newhope Street and Garden Grove Boulevard.

Project No. 7 was completed in 2009. It was packaged with Project No. 61 and the total cost was \$2,532,000.

Priority No. 9 (Project No. 9) Garden Grove Boulevard, Harbor Boulevard to West Street

There were two parallel sewers in Garden Grove Boulevard between Harbor Boulevard and West Street. The

northerly sewer is 18-inches in diameter. The southerly sewer is 10-inches in diameter. The hydraulic model showed that the flows in the 18-inch sewer would exceed the District's depth to diameter criterion due to the many anticipated development projects tributary to this line. One reach of the 10-inch sewer would also become deficient due to the Partridge Pump Station and forcemain that now diverts the flows generated at the mobile home park at the south end of Partridge Street, north to Garden Grove Boulevard.

Project No. 9 replaced the 10-inch sewer with 1184 feet of 24-inch diameter pipe. Flows have been diverted from the existing northerly sewer (15-inches east of Harbor Boulevard, 18-inches west of Harbor Boulevard) on Garden Grove Boulevard to the 24-inch sewer.

Project No. 9 was completed in 2008. Its cost was \$845,000.

Priority No. 10 (Project No. 6) Gilbert Street, north of Shannon Avenue to Chapman Avenue

The system hydraulic model showed a portion of this 10-inch sewer to flow at depth to diameter ratios of 0.78 to 1.00 with peak dry weather flows, even after Diversion Project No. 77. Although the field flow monitoring did not show greater than 0.57 depth to diameter ratio at the location monitored, with upcoming development in the tributary area, this sewer was recommended to be replaced with a 15-inch pipe between Manholes 10090 and 13884. The total length was 1737 feet.

Project No. 6 was completed in 2009. The project cost was \$665,000

Priority No. 11 (Project No. 101) Tiffany Pump Station Replacement

The construction of a replacement facility with a firm capacity of 1,560 gpm was completed in Fiscal Year 2010-2011. The new pump station was placed in service in 2011. The project cost was \$2,493,000.

Priority No. 12 (Project No. 8) Buaro Street, Hoggan Avenue to Harbor Boulevard

The purpose of this project was to provide relief to the sewers in:

- Lampson Avenue between Buaro Street and West Street
- West Street between Lampson Avenue and Stanford Avenue

This project was completed in 2009. It consisted of the following:

- 274 feet of 12-inch sewer in Buaro Street between Hoggan Avenue (14370) and Lampson Avenue (12147)
- Approximately 2320 feet of 15-inch sewer in Buaro Street between Lampson Avenue (12147) and Harbor Boulevard (14361).

Project No. 8 was completed in 2009. The project cost was \$686,800.

Priority No. 13 (Project No. 102) Belgrave Pump Station Replacement

The District has completed construction of the replacement project in 2013 with a firm capacity of 1,560 gpm,

which. The project cost was \$2,469,000.

Priority No. 14 (Project No. 3) Garden Grove Boulevard, Village Center Drive to Hoover Street

The system hydraulic model showed this sewer to be full with peak dry weather flows. Flow monitoring conducted in April 2005 showed a peak depth to diameter ratio of 0.80, indicating that the pipe may be flowing full. The project replaced 1488 feet of 8-inch pipe with 12-inch pipe between Manholes 7140 and 7174. It was combined with a City of Stanton project that diverted some of the Coast Sewer tributary area west to this facility.

Project No. 102 was completed in 2009. The District's share of this project is \$272,100.

Priority No. 15 (Project No. 20) Lampson Avenue, Haster Street to Volkwood Street

The system hydraulic model showed the 1453 feet of 8-inch pipe between Manholes 12643 and 13806 to be full with peak dry weather flows. It was replaced in 2012 with a 15-inch pipe.

Project No. 20, 21, 22, and 23 were packaged together. The total project cost was \$1,472,000.

Priority No. 16 (Project No. 21) Lampson Avenue, Easement to Haster Street

The system hydraulic model showed the 1350 feet of 8-inch pipe between Manholes 12627 and 12643 to be full with peak dry weather flows. It was replaced in 2012 with a 15-inch pipe.

Project No. 20, 21, 22, and 23 were packaged together. The total project cost was \$1,472,000.

Priority No. 17 (Project No. 10) Diversion to OCSD Euclid Trunk Sewer, Lampson Avenue at Euclid Street

Project No. 10 was completed in 2007. It has relieved sewers with calculated capacity deficiencies in Main Street between Lampson Avenue and Garden Grove Boulevard, by diverting the flow at Manhole 12790 to Euclid Trunk Sewer.

The project cost was \$27,800

Priority No. 18 (Project No. 11) Diversion to OCSD Newhope-Placentia Trunk Sewer, Trask Avenue West of Clinton Street

Project No. 11 was completed in 2010. It has relieved the capacity deficiencies in Trask Avenue between East Garden Grove Wintersburg Channel and Harbor Boulevard, by diverting the flows to OCSD's Newhope-Placentia Trunk Sewer at Manhole 6754. This project also eliminated the inverted siphon under the channel just west of the proposed diversion.

The project cost was \$154,600.

Priority No. 19 (Project No. 12) Brookhurst Street, Hill Road to Chapman Avenue

Project No. 12 was completed in 2010. The system hydraulic model showed this sewer to be full with peak dry weather flows. Flow monitoring conducted in September 2004 showed a peak depth to diameter ratio of 0.82, indicating that the pipe may be flowing full. This project replaced 1952 feet of 10-inch pipe with 18-inch pipe between Manholes 14748 and 14744.

Project No. 12, 13, 16, and 17 were packaged together. The total project cost was \$1,702,600.

Priority No. 20 (Project No. 13) Brookhurst Street, Parliament Avenue to Hill Road

Project No. 13 was completed in 2010. The system hydraulic model showed the existing 10-inch diameter pipe between Manholes 14762 and 14748 to be full with peak dry weather flows. This project replaced 1463 feet of 10-inch pipe with 15-inch pipe.

Project No. 12, 13, 16, and 17 were packaged together. The total project cost was \$1,702,600.

Priority No. 21 (Project No. 16) Parliament Avenue, Palmwood Drive to Dallas Drive

Project No. 16 was constructed in 2010. The system hydraulic model showed this 1096 feet of 8-inch line with depth to diameter ratios of 0.68 to 1.00 at peak dry weather flows. Project No. 16 replaced the existing sewer with a 12-inch line between Manholes 9832 and 14803.

Project No. 12, 13, 16, and 17 were packaged together. The total project cost was \$1,702,600.

Priority No. 22 (Project No. 17) Parliament Avenue, Dallas Drive to Brookhurst Street

Project No. 17 was constructed in 2010. This line is shown by the hydraulic model to flow full with peak dry weather flows between Manholes 14803 and 14762. Flow monitoring conducted at 14762 in September 2004 verified this. Project No. 17 replaced the existing sewer with 1603 feet of 12-inch pipe.

Project No. 12, 13, 16, and 17 were packaged together. The total project cost was \$1,702,600.

Priority No. 23 (Project No. 19) Galway Street, Central Avenue to Trask Avenue

Project No. 19 was completed in 2009. It involved the replacement of 1358 feet of 12-inch diameter pipe with milder slope than the rest of the system in Galway Street. The model showed this reach to be deficient even after significant flow diversion with Project No. 2. It was replaced with an 18-inch pipe between Manholes 12052 and 14517. It also included replacement of 1746 feet of 8-inch pipe with 10-inch pipe and 12-inch pipe in Garden Grove Boulevard between Brookhurst Way and Galway Street (MH 11335 to 14483).

Project No. 19, 35, and 45 were packaged together. The total project cost was \$1,478,900.

Priority No. 24 (Project No. 22) Easement, Twintree Circle to Lampson Avenue

Project No. 22 was completed in 2012. The system hydraulic model showed the depth to diameter ratios in

730 feet of 8-inch pipe between Manholes 12625 and 12627 to be 0.80 to 1.00 with peak dry weather flows. Along with Project #23, a 12-inch diversion sewer was constructed to the south west to Manhole 15024 on Lampson Avenue, east of Haster Street.

Project No. 20, 21, 22, and 23 were packaged together. The total project cost was \$1,472,000.

Priority No. 25 (Project No. 23) Twintree Circle, East of Anzio Circle

Project No. 23 was completed in 2012. The system hydraulic model showed the depth to diameter ratios in 495 feet of 8-inch pipe between Manholes 12647 and 12625 to be 0.69 to 1.00 with peak dry weather flows. Along with Project #23, a 12-inch diversion sewer was constructed to the south west to Manhole 15024 on Lampson Avenue, east of Haster Street.

Project No. 20, 21, 22, and 23 were packaged together. The total project cost was \$1,472,000.

Priority No. 26 (Project No. 24) Twintree Lane, Haster Street to Volkwood Street

Project No. 24 was completed in 2012. The system hydraulic model showed the 1463 feet of 8-inch pipe between Manholes 12644 and 13807 to flow full with peak dry weather flows. It was replaced with a 15-inch pipe.

Project No. 24, 25, and 26 were packaged together. The total project cost was \$970,000.

Priority No. 27 (Project No. 25) Haster Street, Allard Avenue to Twintree Lane

Project No. 25 was completed in 2012. The system hydraulic model showed this line between Manholes 12656 and 12644 to have peak dry weather flow depth to diameter ratios from 0.67 to 0.71. The existing 500 feet of 8-inch pipe was replaced with a 10-inch pipe.

Project No. 24, 25, and 26 were packaged together. The total project cost was \$970,000.

Priority No. 28 (Project No. 26) Haster Street, Blue Spruce Avenue to Garden Grove Boulevard

Project No. 26 was completed in 2012. The system hydraulic model showed this line between Manholes 12427 and 13228 to have peak dry weather flow depth to diameter ratios from 0.66 to 1.00. The existing 1426 feet of 8-inch pipe was replaced with a 10-inch pipe.

Project No. 24, 25, and 26 were packaged together. The total project cost was \$970,000.

Priority No. 29 (Project No. 27) Cerritos Avenue, Brookhurst Street to Perdido Street

The system hydraulic model showed the 1185 feet of 8-inch pipe between Manholes 9144 and 9215 to flow full with peak dry weather flows. Flow monitoring conducted in 2005 showed a depth to diameter ratio of 0.86 with peak dry weather flows, verifying the deficiency. It is estimated that 89 percent of the flow tributary to this line is contributed by the City of Anaheim territories. It was replaced with a 15-inch pipe.

Project No. 27 and 28 were packaged together. The total project cost was \$633,900.

Priority No. 30 (Project No. 28) Cerritos Avenue, Perdido Street to Gilbert Street

The system hydraulic model showed the 1464 feet of 8-inch pipe between Manholes 9215 and 9343 to flow full with peak dry weather flows. Flow monitoring conducted in 2005 showed a depth to diameter ratio of 0.86 with peak dry weather flows, verifying the deficiency. It is estimated that 89 percent of the flow tributary to this line is contributed by the City of Anaheim territories. It was replaced with a 15-inch pipe.

Project No. 27 and 28 were packaged together. The total project cost was \$633,900.

Priority No. 31 (Project No. 32) Lampson Avenue and Euclid Street

Project No. 32 was completed in 2013. The system hydraulic model showed the 923 feet of 8-inch pipe between Manholes 11766 and 12790 to flow full with peak dry weather flows. It was replaced with a 12-inch pipe.

Project No. 32 was constructed with a project cost is \$964,000.

Priority No. 32 (Project No. 35) Trask Avenue, Gilbert Street to Magnolia Street

Project No. 32 was completed in 2009. The system hydraulic model showed the 1473 feet of 18-inch pipe between Manholes 11525 and 11594 to flow at depth to diameter ratios of 0.66 to 1.00 full with peak dry weather flows, even after the diversion with Project No. 2. Following the completion of Project No. 2, the peak d/D of this reach was measured at about 0.61. Project No. 35 replaced the existing pipe with a 21-inch pipe.

Project No. 19, 35, and 45 were packaged together. The total project cost was \$1,478,900.

Priority No. 33 (Project No. 45) Gilbert Street, Crosby Avenue to Trask Avenue

Project No. 45 was completed in 2009. The system hydraulic model showed the 1824 feet of 8-inch sewer between Manholes 12087 and 11525 to flow at depth to diameter ratios of 0.64 to 0.79 with peak dry weather flows. Project No. 45 replaced the existing pipe with a 12-inch sewer.

Project No. 19, 35, and 45 were packaged together. The total project cost was \$1,478,900.

Priority No. 34 (Project No. 90) Newland Street, north of Westminster Avenue

The system hydraulic model showed the 190 feet of 8-inch sewer between Manholes 6995 and 7006 to flow at depth to diameter ratios of 1.00 with peak dry weather flows. It was paralleled with an 8-inch sewer (Manhole 14541 to 14544), eliminating the deficiency.

Project No. 90 was completed in 2010. The project cost is \$23,800.

Priority No. 35 (Project No. 56) Diversion to Parallel GGSD Sewer at Yockey Street north of Trask Avenue

This project diverted flows from Manhole 11607 to 11612.

Project No. 56 was completed in 2008. The project cost was \$61,100.

Priority No. 36 (Project No. 80) Diversion to OCSD Trunk Sewer at Stanford Avenue and Nelson Street

Project 80 was for the purpose of relieving sewers with calculated capacity deficiencies on Stanford Avenue, Acacia Parkway, and Grove Street, by diverting the flow at Manhole 13424 to the OCSD trunk sewer in Nelson Street.

Project No. 80 was completed in 2008. The project cost was \$215,700.

Priority No. 37 (Project No. 57) Grove Street, Acacia Avenue to Garden Grove Boulevard

The system hydraulic model showed the 648 feet of 8-inch sewer between Manholes 11842 and 12260 to flow at a depth to diameter ratios of 0.78 with peak dry weather flows after Project No. 80 was implemented. Project No. 57 was completed in 2008 by constructing a new sewer on Grove Avenue. The project cost was \$350,000.

Priority No. 38 (Project No. 60) Elmwood Street and Lampson Avenue

The system hydraulic model showed the 1895 feet of 6-inch and 8-inch sewer between Manholes 12316 and 11766 to flow at a depth to diameter ratios of 0.70 to 0.82 with peak dry weather flows. It was replaced with 1155 feet of 8-inch sewer in Elmwood Street and 740 feet of 12-inch sewer in Lampson Avenue.

Project No. 60 was completed with Project #32 in 2013. The estimated project cost is \$964,000.

Priority No. 39 (Project No. 61) Garden Grove Boulevard, east of Palm Street

The system hydraulic model showed that 212 feet of 10-inch sewer between Manholes 12457 and 13721 will flow at a depth to diameter ratios of 0.66 with peak dry weather flows. This reach was replaced with 15-inch pipe.

Project No. 61 was completed in 2008 in conjunction with Project No. 7 which had a total cost of \$2,532,000.

Priority No. 40 (Project No. 70) Chapman Avenue, Loreleen Street to Magnolia Street

The system hydraulic model showed the 1307 feet of 18-inch sewer between Manholes 13877 and 10846 to flow at depth to diameter ratios of 0.68 to 1.00 with peak dry weather flows. The system hydraulic model showed the 256 feet of 8-inch sewer between Manholes 10325 and 10846 to flow at a depth to diameter ration of 0.68 with peak dry weather flows.

Project No. 70 was replaced with a 24-inch sewer in 2008. The project cost was \$953,000.

Priority No. 41 (Project No. 71) Chapman Avenue, Gilbert Street to Loreleen Street

The system hydraulic model showed the 1079 feet of 18-inch sewer between Manholes 13884 and 13877 to flow at depth to diameter ratios of 0.75 to 0.80 with peak dry weather flows.

This line was replaced with a 24-inch sewer in 2008. The project cost was \$853,000

Priority No. 42 (Project No. 72) Chapman Avenue, Brookhurst Street to Gilbert Street

The system hydraulic model shows the 2666 feet of 15-inch sewer between Manholes 14744 and 14281 to flow at depth to diameter ratios of 0.68 to 1.00 with peak dry weather flows. Flow monitoring conducted along the mildest reach of this pipe had a peak dry weather depth to diameter ratio of 0.59. Although the field flow monitoring did not show greater than 0.59 depth to diameter ratio at the location monitored, with upcoming development in the tributary area, this sewer was replaced with a 18-inch and 24-inch.

The hydraulic model also shows 385 feet of 10-inch sewer between manholes 10043 and 10047 to flow at d/D of 0.65 to 0.76 with peak dry weather flows. These pipes were replaced with 15-inch pipe.

Project No. 72 was completed in 2013. The project cost was \$2,497,000.

Priority No. 53 (Project No. 54) Lampson Avenue, West of Brookhurst Street

The system hydraulic model showed the 565 feet of 8-inch sewer between Manholes 9445 and 9481 to flow at a depth to diameter ratio of 0.71 to 1.00 with peak dry weather flows. Flow monitoring conducted in July 2007 confirmed the deficiency. It was replaced with a 12-inch sewer.

Project No. 54, 55, 74, and 36 were packaged together. The project was completed in 2014, with a total project cost was \$2,129,900.

Priority No. 54 (Project No. 55) Brookhurst Street, Bonser Avenue to Lampson Avenue

The system hydraulic model showed the 1355 feet of 8-inch sewer between Manholes 9455 and 9445 to flow at a depth to diameter ratios of 0.65 to 0.76 with peak dry weather flows. It was replaced with a 12-inch sewer.

Project No. 54, 55, 74, and 36 were packaged together. The project was completed in 2014, with a total project cost was \$2,129,900.

Priority No. 55 (Project No. 74) Lampson Avenue, Spruce Street to Gilbert Street

The system hydraulic model showed the 2023 feet of 10-inch sewer between Manholes 9481 and 9521 to flow at depth to diameter ratios of 0.65 to 1.00 with peak dry weather flows. It was replaced with a 12-inch sewer.

Project No. 54, 55, 74, and 36 were packaged together. The project was completed in 2014, with a total project cost was \$2,129,900.

Priority No. 56 (Project No. 36) Lampson Avenue, Gilbert Street to Leroy Avenue

The system hydraulic model showed the 1325 feet of 10-inch and 12-inch sewer between Manholes 9521 and 9111 to flow at depth to diameter ratios of 0.65 to 1.00 with peak dry weather flows. It was replaced with an 18-inch pipe.

Project No. 54, 55, 74, and 36 were packaged together. The project was completed in 2014, with a total project cost was \$2,129,900.

Priority No. 57 (Project No. 64) Joyzelle Street, Barkley Drive to Gilbert Street

The system hydraulic model showed that the 1255 feet of 8-inch sewer between Manholes 10100 and 10108 has depth to diameter ratios of 0.70 to 0.73 with peak dry weather flows. Flow monitoring conducted in March 2006 confirmed the deficiency. It was replaced with a 10-inch sewer.

Project Nos. 64 and 82 were packaged together and were constructed in 2015, with a total project cost of \$658,000.

Priority No. 72 (Project No. 33) Westminster Avenue, Roxey Drive to Clinton Street

The system hydraulic model showed the 689 feet of 10-inch pipe between Manholes 7482 and 7508 to flow at depth to diameter ratios of 0.82 to 1.00 full with peak dry weather flows. Flow monitoring conducted in December 2011 resulted in peak dry weather depth to diameter ratios up to 0.32. It was replaced with a 15-inch pipe.

Project No. 33 was constructed in 2013.

Priority No. 73 (Project No. 34) Westminster Avenue, Clinton Street to Harbor Boulevard

The system hydraulic model showed the 2666 feet of 12-inch pipe between Manholes 7508 and 7556 to flow at depth to diameter ratios of 0.64 to 1.00 full with peak dry weather flows. Minimal capacity available was verified in the field by City staff observation. It was replaced with an 18-inch pipe.

Project No. 34 was constructed in 2013.

Priority No. 81 (Project No. 82) Hill Road, West of Garden Drive

The system hydraulic model shows the 774 feet of 8-inch sewer between Manholes 10203 and 14748 to flow at a depth to diameter ratio of 0.65 with peak dry weather flows. Flow monitoring conducted in December 2011 resulted in peak dry weather depth to diameter ratios up to 0.38. It was replaced with a 10-inch sewer.

Project Nos. 64 and 82 were packaged together and were constructed in 2015, with a total project cost of \$658,000.

Priority No. 47 (Project No. 59) Traylor Way, Dawson Street to Brookhurst Street

The system hydraulic model showed the 917 feet of 8-inch sewer between Manholes 10507 and 11369 to

flow at a depth to diameter ratios of 0.64 to 0.75 with peak dry weather flows. Flow monitoring conducted in February 2006 resulted in peak dry weather depth to diameter ratios up to 0.64. It will need to be replaced with a 12-inch sewer.

Project No. 59 and 65 were packaged together and were constructed in 2012. The total project cost was \$768,672.

Priority No. 48 (Project No. 65) Deanann Street, Morningside Drive to Hazard Avenue

The system hydraulic model shows the 8-inch sewer between Manholes 7264 and 7558 to flow at a depth to diameter ratios of 0.79 to full with peak dry weather flows. The deficiency was verified in the field in Morningside Drive north of Hazard Avenue by City staff observation. The siphon crossing beneath the Westminster channel (manhole 7265 to 7266) and the portion of sewer underneath private property (manhole 7266 to 7267) was observed to flow at depth of 2.5 inches to 3 inches during peak flow. These sections are not included in the project. The total project includes the replacement of 1327 feet of 8-inch sewer with a 12-inch sewer.

Project No. 59 and 65 were packaged together and were constructed in 2012. The total project cost was \$768,672.

Priority No. 58 (Project No. 53) Nutwood Street, Molama Circle to Garden Grove Boulevard

The system hydraulic model showed the 334 feet of 8-inch and 10-inch sewer between Manholes 11229 and 13361 to flow at depth to diameter ratios of 0.66 to full with peak dry weather flows. Flow monitoring conducted in Manhole 13361 in February 2005 showed a depth to diameter ratio of 0.50 with peak dry weather flows, which is below the District's criterion. Development in the tributary area was monitored and this line was replaced with 1331 feet of 12-inch pipe and 1649 feet of 15-inch pipe.

Project No. 53 and No. 44 were constructed in 2017, with a total construction cost of \$1,269,000.

Priority No. 74 (Project No. 44) Imperial Avenue, East of Magnolia Street to OCSD's Magnolia Trunk Sewer

The system hydraulic model showed the 541 feet of 8-inch sewer in Imperial Avenue between Manholes 11545 and 11587 to flow at depth to diameter ratios of 0.66 to 0.67 with peak dry weather flows. The sewer in Magnolia Avenue between Manhole 11588 and 11590 are estimated to be flowing full. Minimal capacity available was verified in the field by City staff observation. It is recommended to replace the 541 feet of sewer in Imperial Avenue with a 10-inch sewer that ties into the existing OCSD trunk Sewer in Magnolia, alleviating the existing GGSD sewer in Magnolia which will then not have to be upsized.

Project No. 44 and 53 were constructed in 2017. The total project cost was \$1,269,000.

Priority No. 61 (Project No. 91) Trask Avenue, Jackson Street to Coast Street

The system hydraulic model showed the 525 feet of 10-inch sewer between Manholes 7076 and 7115 to flow at depth to diameter ratios of 0.79 to 1.00 with peak dry weather flows. Flow monitoring conducted in

November 2011 resulted in peak dry weather depth to diameter ratios up to 0.68. This line was replaced with a 15-inch sewer.

Project No. 91, 51, 76, 63, and 68 were constructed together in Fiscal year 2017-2018, with a total construction cost of is \$1,620,000.

Priority No. 65 (Project No. 51) Stanford Avenue, Blackthorn Street to Brookhurst Street

The system hydraulic model showed the 914 feet of 8-inch sewer between Manholes 11322 and 13323 to flow at depth to diameter ratios of 0.66 to 1.00 with peak dry weather flows. Flow monitoring conducted in August 2011 resulted in peak dry weather depth to diameter ratios up to 0.53. This line was replaced with a 12-inch sewer.

Project No. 51 was constructed in Fiscal year 2017-2018. See Project No. 91 for the project cost.

Priority No. 77 (Project No. 76) Josephine Street, North of Acacia Avenue to Garden Grove Boulevard

The system hydraulic model showed the 852 feet of 8-inch sewer between Manholes 8393 and 9394 to flow at a depth to diameter ratios of 0.64 to 0.68 with peak dry weather flows. Flow monitoring conducted in December 2011 resulted in peak dry weather depth to diameter ratios up to 0.47. This line was replaced with a 10-inch sewer.

Project No. 76 was constructed in Fiscal year 2017-2018. See Project No. 91 for the project cost.

Priority No. 75 (Project No. 63) Newland Street, Garden Grove Freeway to Gloria Avenue

The system hydraulic model showed the 1010 feet of 8-inch sewer between Manholes 7660 and 7665 to flow at a depth to diameter ratios of 0.66 to 0.74 with peak dry weather flows. Flow monitoring conducted in August 2011 resulted in peak dry weather depth to diameter ratios up to 0.46. This line was replaced with a 12-inch sewer.

Project No. 63 was constructed in Fiscal year 2017-2018. See Project No. 91 for the project cost.

Priority No. 45 (Project No. 68) Onyx Street, north of Chapman Avenue

The system hydraulic model shows the 253 feet of 8-inch sewer between Manholes 7384 and 7386 to flow at a depth to diameter ratio of 0.70 with peak dry weather flows. Flow monitoring conducted in November 2011 resulted in peak dry weather depth to diameter ratios up to 0.87. This line was replaced with a 10-inch sewer.

Project No. 68 was constructed in Fiscal year 2017-2018. See Project No. 91 for the project cost.

Priority No. 76 (Project No. 93) Westminster Avenue, Anita Place to Euclid Street

The system hydraulic model showed the 620 feet of 12-inch sewer between Manholes 11967 and 11974 to flow at depth to diameter ratios of 0.71 with peak dry weather flows. Flow monitoring conducted in November 2011 resulted in peak dry weather depth to diameter ratios up to 0.43. This line was replaced with a 15-inch sewer.

Project No. 93 was constructed in 2019 with a total project cost of \$753,000.

Priority No. 51 (Project No. 99) Ward Street, Davit Avenue to McFadden Avenue

The system hydraulic model showed the 8-inch sewer between Manholes 7312 and 7318 to flow full with peak dry weather flows. Flow monitoring conducted in September 2011 confirmed the deficiency.

Project No. 99 is in design and construction stages. The estimated project cost is \$680,000. The tributary area to this sewer in Ward Street includes areas within the Cities of Santa Ana and Westminster (Midway City Sanitary District service area). If a replacement sewer is needed, the appropriate agencies will share in the cost of the construction.

Priority No. 52 (Project No. 96) Ward Street, north of Bolsa Avenue

The system hydraulic model showed the 200 feet of 8-inch sewer between Manholes 7301 and 7302 to flow at depth to diameter ratios of 0.65 with peak dry weather flows. Flow monitoring conducted in September 2011 resulted in peak dry weather depth to diameter ratios up to 0.83. It will need to be replaced with a 10-inch sewer.

Project No. 96 is in design and construction stages. The estimated project cost is \$174,000.

Priority No. 62 (Project No. 92) Donegal Drive, Madison Circle to Bolsa Avenue

The system hydraulic model showed the 1478 feet of 8-inch sewer between Manholes 6938 and 6937 to flow at depth to diameter ratios of 0.64 to 1.00 with peak dry weather flows. Flow monitoring conducted in August 2011 resulted in peak dry weather depth to diameter ratios up to 0.66. It will need to be replaced with a 12-inch sewer.

Project No. 92 is in design and construction stages. The estimated project cost is \$1,541,000.

Priority No. 71 (Project No. 31) Diversion to OCSD's South Anaheim Interceptor Sewer at Lampson Avenue and 9th Street

Project No. 31 will relieve the sewers in 9th Street south of Lampson Avenue by diverting the flow from the area tributary to the intersection of 9th Street and Lampson Avenue into OCSD's South Anaheim Interceptor Sewer at Manhole 12533. Flow monitoring conducted in July 2009 in 9th Street downstream of the diversion location, resulted in peak dry weather depth to diameter ratios up to 0.42. Also included with this project is 360 feet of 10-inch pipe located in Lampson Avenue just east of 9th Street. The hydraulic model shows the existing 8-inch pipe from between Manholes 12526 and 12533 to flow at a depth to diameter ratio of 0.64 with

peak dry weather flows.

Project No. 31 is in design and construction stages. The estimated project cost is \$632,000.

Future Projects

Priority No. 43 (Project No. 46) Monarch Street, Anaconda Avenue to Lampson Avenue

The system hydraulic model shows the 540 feet of 8-inch sewer between Manholes 8104 and 8098 to flow at depth to diameter ratio of 0.81 with peak dry weather flows. This deficiency was verified in the field by City staff observation. It will need to be replaced with a 12-inch sewer.

Project No. 46 is scheduled for year 2020-2025. The estimated project cost is \$563,000.

Priority No. 44 (Project No. 75) Lampson Avenue, Monarch Street to Western Avenue

The system hydraulic model shows the 1320 feet of 12-inch sewer between Manholes 8098 and 7189 to flow at depth to diameter ratios of 0.64 to 0.76 with peak dry weather flows. It will need to be replaced with a 15-inch sewer.

Project No. 75 is scheduled for year 2020-2025. The estimated project cost is \$1,721,000.

Priority No. 46 (Project No. 43) Lamplighter Street and Lenore Avenue

The system hydraulic model shows the 1462 feet of 8-inch sewer between Manholes 7729 and 7404 to flow at depth to diameter ratios of 0.68 to 0.71 with peak dry weather flows. Minimal capacity available was verified in the field by City staff observation. It will need to be replaced with a 12-inch sewer.

Project No. 43 is currently scheduled for year 2020-2025. The estimated project cost is \$1,513,000.

Priority No. 50 (Project No. 56A) Reestablish flow to Parallel GGSD Sewer in Yockey Street (east side of street) north of Trask Avenue

The system hydraulic model shows the 8-inch sewer in Yockey Street north of Trask Avenue to flow with depth to diameter ratios of about 0.71 with peak dry weather flows. Field depth checks performed in March 2012 resulted in 5 inches of flow or a depth to diameter ratio of 0.63. This project will reestablish the 8" sewer from Manhole 11607 to 14201. The flow will ultimately be split between the two parallel 8" sewers in Yockey Street north of Trask Avenue.

Project No. 56A is currently scheduled for year 2020-2025. The estimated project cost is \$35,000

Priority No. 59 (Project No. 79) Chapman Avenue, west of Harbor Boulevard

The system hydraulic model shows the 1045 feet of 12-inch sewer between Manholes 13028 and 13052 to flow at depth to diameter ratios of 0.66 to 0.69 with peak dry weather flows. Flow monitoring conducted in November 2011 confirmed the deficiency. It will need to be replaced with an 18-inch sewer.

The flow tributary to 13028 at the intersection of Harbor Boulevard and Chapman Avenue is currently channeled to the west except for emergency overflow conditions, when it can flow south into the “Hotel Line” in Harbor Boulevard.

West of Harbor Boulevard, the flow tributary to 13052 must be allowed to split to the west and the south to prevent peak dry weather depth to diameter ratios exceeding 0.62 in the existing 15-inch sewer (south side of Chapman Avenue). Currently, the flow at 13052 is normally channeled to the south and prevented from flowing to the west.

All flow tributary to this line is generated by the City of Anaheim and Orange territories.

Project No. 79 is scheduled for year 2020-2025. The project cost should be paid by the City of **Anaheim and Orange**.

Priority No. 60 (Project No. 67) Chapman Avenue, east of Harbor Boulevard

The system hydraulic model shows the 805 feet of 12-inch sewer between Manholes 13025 and 13028 to flow at a depth to diameter ratios of 0.65 to 0.71 with peak dry weather flows. Flow monitoring conducted in November 2011 resulted in peak dry weather depth to diameter ratios up to 0.56. It will be replaced with a 15-inch line.

Approximately 80 percent of the flow in this line is generated by the City of Anaheim and Orange territories. Project No. 67 is scheduled for year 2020-2025. The District’s share of the estimated project cost is \$210,000.

Priority No. 63 (Project No. 47) Banner Drive, east of Newhope Street

The system hydraulic model shows the 1185 feet of 8-inch between Manholes 10893 and 10866 to flow at depth to diameter ratios of 0.77 to 0.82 with peak dry weather flows. Flow monitoring conducted in August 2011 resulted in peak dry weather depth to diameter ratios up to 0.62. It will need to be replaced with a 12-inch sewer.

Project No. 47 is scheduled for Fiscal year 2020-2025. The estimated project cost is \$1,236,000.

Priority No. 64 (Project No. 48) Newhope Street, Banner Drive to Paloma Avenue

The system hydraulic model shows the 517 feet of 8-inch sewer between Manholes 10866 and 13175 to flow at depth to diameter ratios of 0.73 to 0.79 with peak dry weather flows. It will need to be replaced with a 12-inch sewer.

Project No. 48 is scheduled for year 2020-2025. The estimated project cost is \$516,000.

Priority No. 66 (Project No. 85) Chapman Avenue, east of Haster Street (Orange Flows)

The system hydraulic model shows the 763 feet of 10-inch sewer between Manholes 12252 and 13004 to

flow full with peak dry weather flows. Flow monitoring conducted in November 2011 resulted in peak dry weather depth to diameter ratios up to 0.51. It will need to be replaced with a 12-inch sewer.

The flows in this line are generated by the City of Orange territories.

Project No. 85 is scheduled for year 2020-2025. The project cost should be paid for by the City of Orange.

Priority No. 78 (Project No. 37) Belgrave Avenue, St. Mark Street to Belgrave Pump Station

The system hydraulic model shows the 290 feet of 12-inch sewer between Manholes 8653 and 8913 to flow full with peak dry weather flows. It will need to be replaced with an 18-inch sewer.

Project No. 37 is scheduled for year 2020-2025. The estimated project cost is \$454,000.

Priority No. 79 (Project No. 38) Laurelton Avenue, Bailey Street to St. Mark Street

The system hydraulic model shows the 325 feet of 8-inch sewer between Manholes 7780 and 8652 to flow at full with peak dry weather flows. It will need to be replaced with a 12-inch sewer.

Project No. 38 is scheduled for year 2020-2025. The estimated project cost is \$324,000.

Priority No. 80 (Project No. 39) Bailey Street, south of Chapman Avenue to Laurelton Avenue

The system hydraulic model shows the 442 feet of 8-inch between Manholes 8909 and 7780 to flow full with peak dry weather flows. It will need to be replaced with a 12-inch sewer.

Project No. 39 is scheduled for year 2020-2025. The estimated project cost is \$461,000.

Eliminated Projects

Project No. 18 (Eliminated) Gilbert Street, Orangewood Avenue to Skylark Boulevard

Project No. 18 has been eliminated as a result of Project No. 77 in Joyzelle Street, which will divert flows to the west and alleviate the capacity problems in Gilbert Street.

Project No. 29 (Eliminated) Diversion to OCSD's Newhope-Placentia Trunk Sewer at Newhope Street and Woodbury Road

Project No. 29 was recommended to relieve the sewers in Woodbury Road, Libby Lane, Shirley Street and Westminster Avenue east of Euclid Street by diverting the flow from the area tributary to Newhope Street and Paloma Avenue into OCSD's Newhope-Placentia Trunk Sewer. After further investigation, the connection to OCSD's trunk was found to already exist. Therefore, Project No. 29 is eliminated.

Project No. 30 (Eliminated) Diversion to OCSD's Newhope Placentia Interceptor Sewer at Newhope Street and Woodbury Road

Project No. 30 was eliminated due to a correction made in the hydraulic model.

Project No. 40 (Eliminated) Acacia Avenue, Cantor Street to Seneca Street

Project No. 40 was eliminated due to a correction made in the hydraulic model.

Project No. 41 (Eliminated) Cantor Street, Stanford Avenue to Acacia Avenue

Project No. 41 was eliminated due to a correction made in the hydraulic model.

Project No. 42 (Eliminated) Stanford Avenue, Lamplighter Street to Cantor Street

Project No. 42 was eliminated due to a correction made in the hydraulic model.

Project No. 49 (Eliminated) Decker Avenue, Jean Street to Endry Street

The system hydraulic model showed the 1018 feet of 10-inch sewer between Manholes 8351 and 8966 to flow full with peak dry weather flows. Flow monitoring conducted at Manhole 8976 in 2002 showed a depth to diameter ratio of 0.64 with peak dry weather flows. However, the City of Anaheim constructed a project on Katella Avenue east of Gilbert Street, which diverted Anaheim flows from this reach, eliminating the capacity deficiency.

Therefore, Project No. 49 is removed from the deficiency list.

Project No. 50 (Eliminated) Endry Street, South of Decker Avenue

The system hydraulic model showed the 301 feet of 10-inch sewer to flow full with peak dry weather flows. Because of the diversion of Anaheim flows described for Project 49, this deficiency has also been eliminated.

Therefore, Project No. 50 has been removed from the deficiency list.

Project No. 52 (Eliminated) Lampson Avenue, Monroe Street to Beach Boulevard

Project No. 52 was eliminated due to a correction made in the hydraulic model.

Project No. 58 (Eliminated) Blackbird Street, Pearce Street, Clinton Street, and Trask Avenue

Project No. 58 is eliminated due to the assumption that the proposed Bahia Development (500-600 du) on Blackbird Street south of Garden Grove Boulevard will consist of a new pump station and forcemain that will divert the tributary flows to Garden Grove Boulevard. The existing sewer that crosses the Garden Grove Freeway (SR-22) will be abandoned. The sewers in Clinton Street will no longer be capacity deficient at that time and will not need to be upgraded.

Project No. 62 (Eliminated) Pacific Avenue, Chamberlin Drive to Gilbert Street (Mostly Anaheim Flows)

Project No. 62 was eliminated due to field review of water depth which did not verify a capacity deficiency.

Project No. 66 (Eliminated) Ward Street, North of Hazard Avenue

Project No. 66 was eliminated due to a correction made in the hydraulic model.

Project No. 69 (Eliminated) Valley View Street, north of Chapman Avenue

Project No. 69 was eliminated due to a correction made in the hydraulic model and field review of water depth which did not verify a capacity deficiency.

Project No. 73 (Eliminated) Dale Street, Orangewood Avenue to Augusta Drive

Project No. 73 was eliminated due to field review of water depth which did not verify a capacity deficiency.

Project No. 78 (Eliminated) Gilbert Street, Joyzelle Drive to Orangewood Avenue

Project No. 78 has been eliminated as a result of Project No. 77 in Joyzelle Street, which will divert flows to the west and alleviate the capacity problems in Gilbert Street.

Project No. 81 (Eliminated) Medina Drive, Ramona Way to Chapman Avenue

Project No. 81 was eliminated due to a correction made in the hydraulic model.

Project No. 83 (Eliminated) Garden Drive, North of Geraldine Road

Project No. 83 was eliminated due to a correction made in the hydraulic model.

Project No. 84 (Eliminated) Harbor Boulevard, Wilken Way to Chapman Avenue (Anaheim Flows)

All the flow in this line is from the City of Anaheim territories. This line has been upsized by the City of Anaheim to 15-inches in diameter. This should be sufficient to handle the peak flows of the tributary area. Project No. 84 is therefore eliminated.

Project No. 86 (Eliminated) Chapman Avenue, west of Grant Place (Anaheim and Orange Flows)

Project No. 86 was eliminated due to a correction made in the hydraulic model.

Project No. 87 (Eliminated) Katella Avenue, Berry Avenue to Magnolia Street (Partly Anaheim Flows)

Project No. 87 was eliminated due to field review of water depth which did not verify a capacity deficiency.

Project No. 88 (Eliminated) Katella Avenue, Gilbert Street to Berry Avenue (Partly Anaheim Flows)

Project No. 88 was eliminated due to field review of water depth which did not verify a capacity deficiency.

Project No. 89 (Eliminated) Aspenwood Avenue, East of Harbor Boulevard

Project No. 89 has been incorporated into Project No. 7.

Project No. 94 (Eliminated) Sycamore Street, Acacia Avenue to Garden Grove Boulevard

A parallel 10-inch line was found to exist in Sycamore Street from Acacia Avenue to Garden Grove Boulevard (Manhole 7099 to 7103). It was apparently constructed by the City of Stanton. Design plans could not be located. The inverts were surveyed and the information was added to the hydraulic model. The previously identified deficiency was eliminated and therefore Project No. 94 was also eliminated.

Project No. 95 (Eliminated) Brookhurst Street, south of Chapman Avenue

Project No. 95 was eliminated due to field review of water depth which did not verify a capacity deficiency.

Project No. 97 (Eliminated) Hope Street, north of Westminster Avenue

Project No. 97 was eliminated due to a correction made in the hydraulic model and field review of water depth which did not verify a capacity deficiency.

Project No. 98 (Eliminated) Chanticleer Road, Deste Drive to Gilbert Street

The system hydraulic model shows the 585 feet of 8-inch sewer between Manholes 9345 and 9339 to flow at depth to diameter ratios of 0.64 with peak dry weather flows. Flow monitoring conducted in 2009 showed this sewer to flow at a depth to diameter ratio of 0.57. Therefore, this project was removed from the deficiency list.

Project No. 100 (Eliminated) Anthony Avenue, Adams Street to east of Alonzo Cook Street

Project No. 100 was eliminated due to a correction made in the hydraulic model.

Project No. 103 (Eliminated) Cypress Street, Imperial Avenue to Russell Avenue

Project No. 103 was eliminated due to field review of water depth which did not verify a capacity deficiency.

Project No. 104 (Eliminated) Easement, west of Ditmore Drive to Lorna Street

Project No. 104 was eliminated due to a correction made in the hydraulic model and field review of water depth which did not verify a capacity deficiency.

Project No. 105 (Eliminated) Gilbert Street, Pacific Avenue to Katella Avenue (Partly Anaheim Flows)

Project No. 105 was eliminated due to field review of water depth which did not verify a capacity deficiency.

Funding Plan

The requirements of the District's System Evaluation and Capacity Assurance Plan and Sewer System Rehabilitation Plan (Section 5 of this report), as well as the operational and maintenance needs of the system were incorporated into a financial plan with recommended annual expenditures.

The sewer rate structure prior to September 2005 had flat monthly charges for the two classes of customers-residential and non-residential. The residential charge was \$4.64 per month and the non-residential was \$5.70 per month. Revenues derived from the existing rate structure could not support the projects that will improve the system's capacity and condition within the recommended schedule.

A pay-as-you-go alternative and a combination pay-as-you-go/pay-as-you use alternative was developed and evaluated to generate the needed revenues. Both alternatives were evaluated with a new rate structure that has a fixed base charge for the various customer classes and a use charge applied to estimated flow to the collection system. The Board of Directors of the Garden Grove Sanitary District considered the new rates, held two public hearings, and adopted the recommendations with minor refinements. The rate structure is capable of implementing approximately \$5 million worth of capacity and condition Improvement projects annually. The rates have been adjusted annually to keep up with increases in the construction industry. Appendix G-2 includes Ordinance 10, which details the District's authority to manage and regulate its sewer user fees.

D. SCHEDULE

Order 2006-0003-DWQ requires that "the Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements".

A list of the completed and scheduled projects (as of November 2019) is included in Table 9-5. The District has completed approximately 80,000 feet of capacity improvements since 2005 when the first SECAP was prepared. Partridge Pump Station was constructed in 2010. Tiffany Pump Station was reconstructed in 2010. The Belgrave Pump Station was reconstructed in 2013.

SECTION 10
MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

The Order requires:

The Enrollee shall:

- (a) *Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;*
- (b) *Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;*
- (c) *Assess the success of the preventative maintenance program;*
- (d) *Update program elements, as appropriate, based on monitoring or performance evaluations; and*
- (e) *Identify and illustrate SSO trends, including: frequency, location, and volume.*

10-1 COMPLIANCE

The District will monitor the effectiveness of its program continuously in order to minimize the possibility of SSOs.

A. RELEVANT INFORMATION

The District keeps updated records of all sewer related documents which include but are not restricted to the following:

- GIS Shapefiles
- CCTV Records
- Maintenance Records
- Hotspot List
- Root Control Program Information
- Equipment Inventory List
- FSE Inspections Information
- Sanitary Sewer Overflow Reports
- Sewer Capital Improvement Program

GIS Shapefiles - The City of Garden Grove's Information Technology division and the Water Services division maintain the GIS shapefiles, which are stored on the City's Intranet.

CCTV Records –Currently, the Information Technology Department joins the CCTV recordings to the Computerized Maintenance Management System (CMMS).

The District maintains a summary database of the CCTV records and recommendations, which were updated as part of this Sewer System Management Plan report.

Maintenance Records - The District's maintenance records are continually updated through its CMMS. This program allows the District to input, retrieve, and track all maintenance activities regarding routine cleaning, Hot Spot cleaning, emergency repairs, manhole inspections, CCTV inspections, pest control, sewer line foaming, and root control.

Hot Spot List - The District evaluates its Hot Spot locations after the following occurrences:

- Sanitary sewer overflow
- Blockages observed from routine maintenance
- Maintenance records of grease, roots, debris from CCTV records
- Odor complaints

Root Control Program - The District hires a certified and insured contractor to perform its root control services every two years. Reaches are added to the root control program as root obstructions are verified from CCTV inspections, cleaning history, or sewer overflow events.

Equipment Inventory – The District maintains an updated and detailed equipment and materials inventory, as detailed in Appendix D-4.

FSE Inspections – Annual FSE inspection data is maintained electronically by the District.

Sanitary Sewer Overflow Reports – SSO report information is maintained on the California Integrated Water Quality System (CIWQS) website.

Sewer Capital Improvement Program – The 2012 SSMP describes the District’s Sewer CIP budget set at: “approximately \$5 million annually (2005 dollars). The rate ordinance has built in escalation for annual adjustments for increases in construction costs.” The District maintains a CIP for both the system capacity improvements and rehabilitation and replacement projects.

B. SSMP MONITORING

Order 2006-0003-DWQ requires the District to “*monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP.*”

Table 10-1 is a summary of the SSMP monitoring performance indicators and response actions the District takes to monitor the implementation and effectiveness of the SSMP elements.

C. SUCCESS OF PREVENTATIVE MAINTENANCE PROGRAM

Order 2006-0003-DWQ requires the City to “*assess the success of the preventative maintenance program.*”

A sewer collection system with less than three (3) spills from the publically owned system (excluding private property spills that do not result from a blockage in the public system) per 100 miles per year is considered an adequate system.

For the District’s sewer system (321 miles), this is an average of about 9.6 (3 x 3.2) spills per year, not including private spills. The District annually evaluates the spills from its sewer system to determine the efficiency of its preventative maintenance plan. The District will make changes as necessary to minimize the number and volume of spills.

D. UPDATE PROGRAM ELEMENTS

Order 2006-0003-DWQ requires the District to “*Update program elements, as appropriate, based on monitoring or performance evaluations.*”

Biennial audits of the SSMP are conducted to measure program effectiveness. The audit itself is a formal methodology for measuring program effectiveness. Based on the findings of the SSMP audit, the District modifies its SSMP elements accordingly.

At a minimum, the District reviews and updates its SSMP document every five (5) years, as required by the Waste Discharge Requirements.

The Change Log is included in Section 13 of this report. Recommendations to the District's SSMP will be tracked in the Change Log. The items in the Change Log will be incorporated into the SSMP documents, when the District conducts its next SSMP update.

E. SSO TRENDS

Order 2006-0003-DWQ requires the City, “*Identify and illustrate SSO trends, including: frequency, location, and volume.*”

The SSO trends are detailed on Figure 10-1 and Table 10-2. Table 10-3 summarizes all SSOs since 2011. A map of the SSO locations is included on Figure 10-2. The number of SSO from 2016 to 2019 maintained below threshold level of 9.6 spills.

Table 10-1

SSMP Monitoring Performance Indicators and Recommended Actions

SSMP Element	Summary of Element Purpose	Performance Indicators for Tracking Effectiveness	Possible Response Actions
1. Goals	Establish priorities of District and provide focus for staff	Annual review of goals based upon results of performance evaluations	Update as necessary.
2. Organization	Document organization of District staff and chain of command / communication for SSO response	Annual review of organization chart and all contact information.	Update and distribute a copy to all parties so they are informed of their responsibilities related to the SSMP elements.
3. Legal Authority	Ensure the District has sufficient legal authority to properly maintain and protect the integrity of the system	Annual review Municipal Code sections and ordinances related to the sewer system annually. Consult District staff to determine if any problems occurred due to inadequate legal authority in relation to the sewer system, SSOs, FOG.	Update as necessary.
4. Operations and Maintenance Program	Minimize blockages and SSOs by properly operating and maintaining the system	Monthly review routine and hot spot cleaning records to ensure the preventative maintenance goals are being met.	Review staffing levels if goals are not being met. Consider use of private contractors.
		Annual review of pump station maintenance logs to ensure preventative maintenance goals are being met.	
		Annual review of CCTV inspections to ensure reinspections are being performed as scheduled based on date of inspection and the existing priority.	
		Annual review of training schedules/records annually to ensure maintenance staff has the appropriate training in all areas related to sewer system maintenance and SSOs.	Revise training schedules as necessary.
		Annual review of SSO statistics: ➤ Total number and volume of SSOs ➤ Number of repeat SSOs at same location ➤ Number of lateral SSOs ➤ Number of mainline SSOs ➤ Total volume spilled ➤ Total amount recovered ➤ Total amount estimated to reach surface waters ➤ Percent reaching surface waters ➤ Number of pipe failures ➤ Total length of pipe cleaned ➤ Total length of hot spots cleaned	

Table 10-1 (Continued)

SSMP Monitoring Performance Indicators and Recommended Actions

SSMP Element	Summary of Element Purpose	Performance Indicators for Tracking Effectiveness	Possible Response Actions
5. Design and Construction Standards	Ensure new facilities are properly designed and constructed	Annual review of existing design and construction standards. New technologies and materials for collection system assets should also be evaluated annually.	Update design and construction standards, as necessary.
6. Overflow Emergency Response Plan (OERP)	Provide timely and effective response to SSO emergencies and comply with regulatory reporting requirements	Annual review of SSOERP document. Annual review of SSO statistics: ➤ Average response time from call to arrival ➤ Average response time from arrival to SSO stoppage and cleanup ➤ Percent of total SSO volume contained or returned to the sewer	Consult maintenance staff for recommendations of improvement based on experiences in field and in reporting SSOs when they occurred. Update as necessary.
7. Fats, Oils & Grease (FOG) Control	Minimize blockages and overflows due to FOG	Annual review of FOG Control Program documents	Consult FSE inspector for recommendations of improvements. Update as FOG Control Program, as necessary.
		Annual review of FSE inspection data to ensure goals are being met	
		Annual review of SSO and FOG statistics: ➤ Number of blockages due to FOG ➤ Number of SSOs due to FOG ➤ Number of FOG producing facilities inspected	Map and correlate SSOs with FSE locations and determine what corrective actions are needed, such as adding portions of system to the frequent cleaning list or further education at upstream FSE locations. This task should be done anytime an SSO occurs.
8. System Evaluation and Capacity Assurance Plan (SECAP)	Provide adequate hydraulic capacity to convey dry and peak wet weather flows through system	Annual review of hydraulic model and capacity improvement program projects.	Update as necessary.
9. Monitoring, Measurement, & Program Modifications	Evaluate effectiveness of SSMP, keep SSMP up-to-date, and identify necessary changes to SSMP Elements	Annual review of performance indicators described in Element 4, 6, & 7.	
10. Program Audits	Formally identify SSMP effectiveness, limitations, and necessary changes.	Perform bi-annual SSMP audit	Keep audits reports on file for a minimum of five (5) years per the SWRCB Monitoring and Reporting Program requirements
11. Communication Plan	Communicate with public and satellite agencies	Annual review of communications program.	Place sewer system related documents on City website.

Figure 10-1
Sanitary Sewer Overflows by Year



Table 10-2
SSOs by Cause

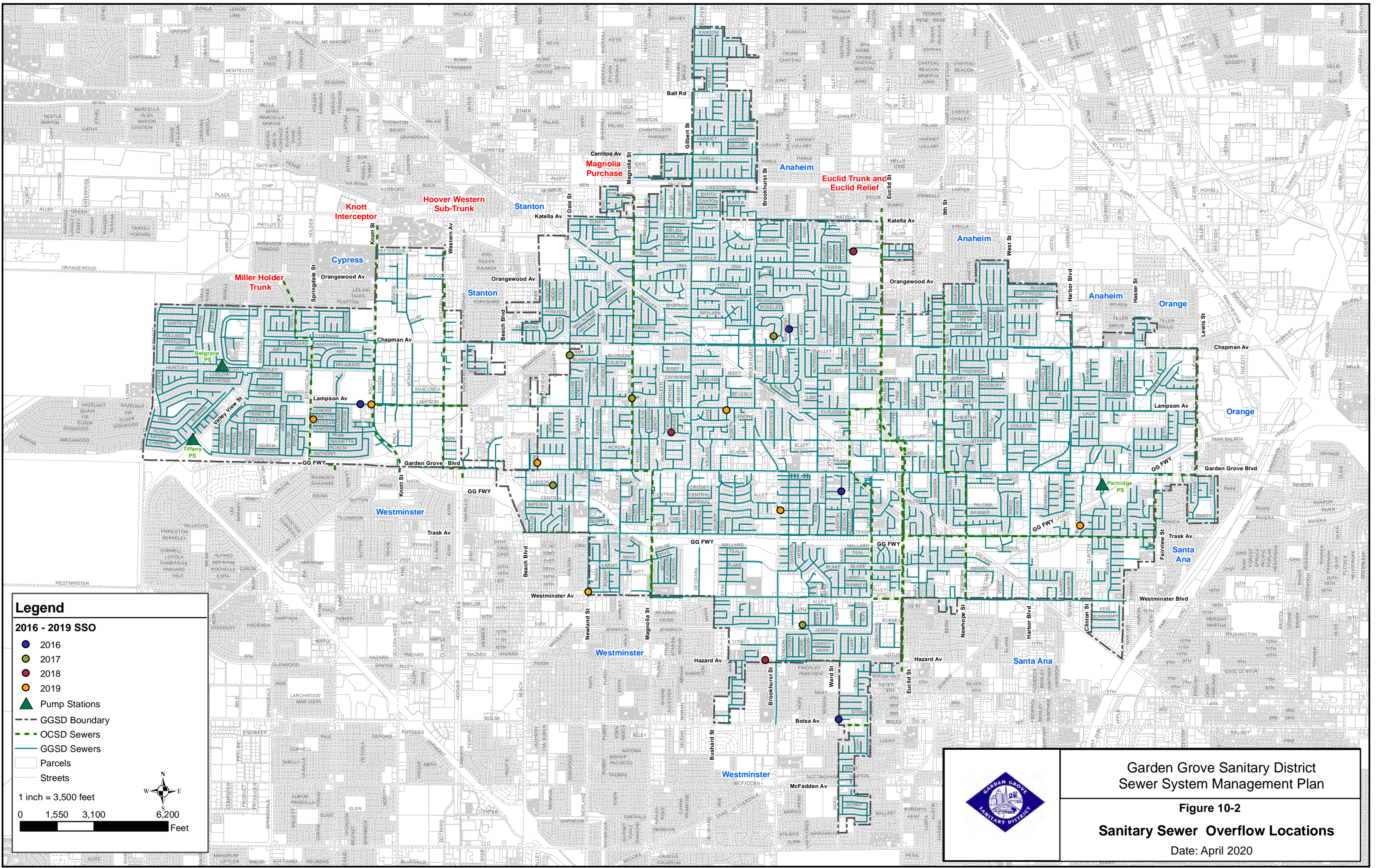
	Public	Private	Debris/Rags	Grease	Roots	Structural	NA	Totals
2011	5	5	2	7		1		10
2012	4	7		10		1		11
2013	6	1	3	1	1		2	7
2014	2	1		3				3
2015	2	1		2	1			3
2016	4	3	2	4	1			7
2017	5	2	2	4	1			7
2018	3	2		3	2			5
2019	7	0	2	3	1	1		7
Totals	38	22	11	37	7	3	2	60

**Table 10-3
Sewer System Overflow Summary**

Year	Date	Public/ Private	Location	Spill Volume (gal)	Recovered Volume (gal)	Likely Cause	Comments
2011	3/22/2011	GGSD	Flower and Crosby	22	22	Debris/rags	
	4/26/2011	Private	13436 Magnolia	30	30	Debris/rags	
	6/7/2011	GGSD	Kern Avenue and Bowen	32	32	Grease	
	6/14/2011	Private	13991 Brookhurst St (Lee's Sandwiches)	18	18	Grease	
	6/21/2011	Private	13011 Brookhurst St	52	52	Structural	
	7/13/2011	Private	12051 Valley View (McDonalds)	62	62	Grease	
	7/17/2011	GGSD	Magnolia at Larson	61	61	Grease	
	8/20/2011	Private	12188 Brookhurst	37	37	Grease	
	10/6/2011	GGSD	Josephine and Anthony	767	767	Grease	
	10/15/2011	GGSD	Brookhurst and Bonser	294	294	Grease	
2012	2/19/2012	Private	8939 Hewitt Pl.	53	53	Grease	
	4/3/2012	Private	12781 Josephine St.	16	16	Grease	
	5/1/2012	Private	9731 Garden Grove Blvd.	16	5	Grease	
	6/25/2012	Private	7725 Garden Grove Blvd.	15	15	Structural	
	7/14/2012	GGSD	12891 9th Street	326	326	Grease	
	8/1/2012	Private	12591 Westminster	69	69	Grease	
	9/4/2012	Private	13436 Magnolia St.	31	31	Grease	
	10/16/2012	Private	13871 Shady Ln.	210	210	Grease	
	11/7/2012	GGSD	13052 Cypress St.	138	138	Grease	
	11/26/2012	GGSD	Adland and Central	531	531	Grease	
12/7/2012	GGSD	Magnolia and Trask	765	765	Grease		
2013	3/14/2013	GGSD	11028 Cynthia Cir.	857	857	Debris/rags	
	9/5/2013	GGSD	13361 Magnolia	NA	NA	NA	Not Reported on CIWQS
	9/6/2013	GGSD	13371 Magnolia	NA	NA	NA	Not Reported on CIWQS
	10/23/2013	GGSD	9670 Trask	203	203	Grease	
	12/11/2013	Private	9691 Hazard Ave.	6	6	Debris/rags	
	12/15/2013	GGSD	Clinton north of Westminster	115	115	Roots	
	12/31/2013	GGSD	13271 Magnolia	812	812	Debris/rags	
2014	3/13/2014	Private	10145 Westminster	NA	NA	Grease	Not Reported on CIWQS
	3/15/2014	GGSD	9031 Imperial Ave.	878	878	Grease	
	6/29/2014	GGSD	Hazard and Brookhurst	496	496	Grease	
2015	1/19/2015	GGSD	11701 Flamingo	31	31	Roots	
	6/12/2015	Private	10120 Westminster	NA	NA	Grease	Not Reported on CIWQS
	7/8/2015	GGSD	9820 Garden Grove Blvd.	10	10	Grease	
	11/8/2015	GGSD	9062 Central Ave.	569	569	Debris/Grease	
	12/14/2015	GGSD	Nutwood and Lampson	378	378	Debris/Grease	

**Table 10-3 (Continued)
Sewer System Overflow Summary**

Year	Date	Public/ Private	Location	Spill Volume (gal)	Recovered Volume (gal)	Likely Cause	Comments
2016	1/2/2016	GGSD	Seacrest and Style	17	17	Grease	
	2/12/2016	Private	13861 Brookhurst St.	NA	NA	Grease	
	3/16/2016	GGSD	6851 Lampson Ave.	112	112	Debris/Rags	
	6/7/2016	Private	9619 Bolsa Ave.	191	191	Grease	
	7/10/2016	GGSD	Benton and Bonnie	102	102	Roots/Grease	
	10/6/2016	GGSD	10181 Morningside Dr.	496	496	Grease	
	11/30/2016	GGSD	Bolsa and Ward	378	378	Debris/Grease	
2017	2/5/2017	GGSD	Magnolia and Lampson	372	372	Grease	
	4/14/2017	Private	8903 Hewitt Pl.	65	65	Grease	
	6/6/2017	GGSD	10181 Morningside	496	496	Debris	
	6/28/2017	GGSD	8205 Larson	121	121	Grease	
	9/30/2017	GGSD	Dale and Amy	162	162	Debris/Grease	
	11/22/2017	Private	12632 Dale St.	36	36	Grease	
	12/28/2017	GGSD	11961 Melody Park Dr.	168	168	Roots	
2018	1/24/2018	GGSD	Hazard and Sheffield	135	135	Grease	
	1/28/2018	Private	13861 Brookhurst St.	34	34	Grease	
	2/18/2018	Private	10191 Lampson St.	75	75	Roots	
	6/18/2018	GGSD	12691 Jerome Ln.	238	238	Roots/Grease	
	8/22/2018	GGSD	10772 Palma Vista	762	762	Grease	
2019	1/6/2019	GGSD	13261 Brookhurst St.	25	25	Debris/Grease	
	1/24/2019	GGSD	6502 Trinette Ave.	45	45	Calcium Blockage	
	4/5/2019	GGSD	Fern north of Garden Grove Blvd	73	73	Debris/rags	
	5/7/2019	GGSD	12513 Knott St.	3	3	Grease	
	7/7/2019	GGSD	Newland and Westminster	630	630	Grease	



Legend

- 2016
- 2017
- 2018
- 2019
- ▲ Pump Stations
- GGSD Boundary
- - - OCSD Sewers
- GGSD Sewers
- ▭ Parcels
- ▬ Streets

1 inch = 3,500 feet

0 1,550 3,100 6,200 Feet

North arrow pointing up.



Garden Grove Sanitary District
Sewer System Management Plan

Figure 10-2
Sanitary Sewer Overflow Locations
Date: April 2020

SECTION 11
SSMP PROGRAM AUDITS

The Order requires:

As part of the SSMP, the District shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file.

This audit shall focus on evaluating the effectiveness of the SSMP and the District's compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.

11-1 COMPLIANCE

The District performs audits of its SSMP documents and update the SSMP program based on the major SSO events annually. The District completed its last SSMP in August 2016. The district has added 3 reaches to the hot spot management program and 20 reaches to the root control program from year 2016 to 2019. The district removed 2 reaches from the hot spot management program during this period through CIP improvements.

SSMP audits for the past five years, at minimum, are kept on file per the State Water Resources Control Board (SWRCB) Monitoring and Reporting Program Requirements.

SECTION 12 COMMUNICATION

The Order requires that:

The District shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the District as the program is developed and implemented.

The District shall also create a plan of communication with systems that are tributary and/or satellite to the District's sanitary sewer system.

12-1 COMPLIANCE

The District provides communication to its customers through informational brochures, door hangers information, grease lids and discussions at public events such as the Public Works Open House, Garden Grove Pride, and the Coast Keeper Outreach Program. The District also provides other innovative means of public outreach, which include a sewer saver display that demonstrates the effect of tree roots and solids on the District's sewers. A hands-on "Knock the Grease Goblin out of the Sewer Game" was also created as part of the District's public outreach program.

The District maintains the SSMP documents at the Municipal Service Center located at 13802 Newhope St., Garden Grove, CA 92840.

The District has placed its current SSMP document on the City of Garden Grove's (City) website:

<http://www.ci.garden-grove.ca.us/pw/sewersystemmanagementplan>

**SECTION 13
CHANGE LOG**

13-1 Compliance

The Section D.14 of Order 2006-0003 require that, *“The SSMP must be updated every five (5) years, and must include any significant program changes.”*

The District performs annual reviews to evaluate the efficiency of its sewer system and its Sewer System Management Plan. Per Order 2006-0003, the District also performs detailed bi-annual SSMP audits. Table 13-1 includes the SSMP Change Log, which provide the District a means to track the necessary changes to the SSMP document. These items will be incorporated into the SSMP document when the District conducts its next update.

**Table 13-1
SSMP Change Log**

Section	Action Item	Status

Section	Action Item	Status



Garden Grove Sanitary District
13802 Newhope Street
Garden Grove, CA 92843